

THE RADIO AMATEUR'S JOURNAL FOR SPECIALIZED COMMUNICATIONS

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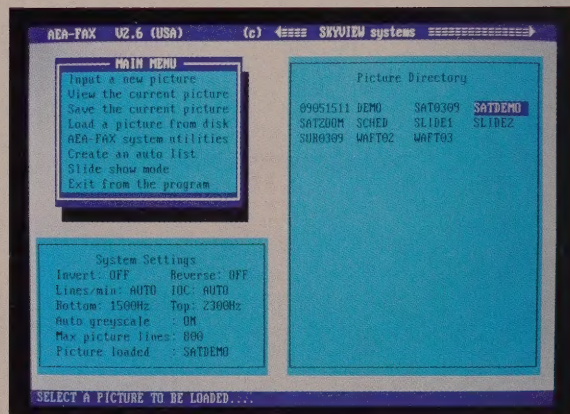
THE SPEC-COM Journal  
P.O. Box 1002  
Dubuque, Ia 52004-1002

**A LOOK AT DEUTSCHE WELLE  
WEFAX - GETTING STARTED IN HRPT  
ALL NEW HAM BBS DIRECTORY  
ATV REPEATER DATA BASE  
THE HOW TO OF TRUNKED RADIO  
1993 DAYTON HAMVENTION**

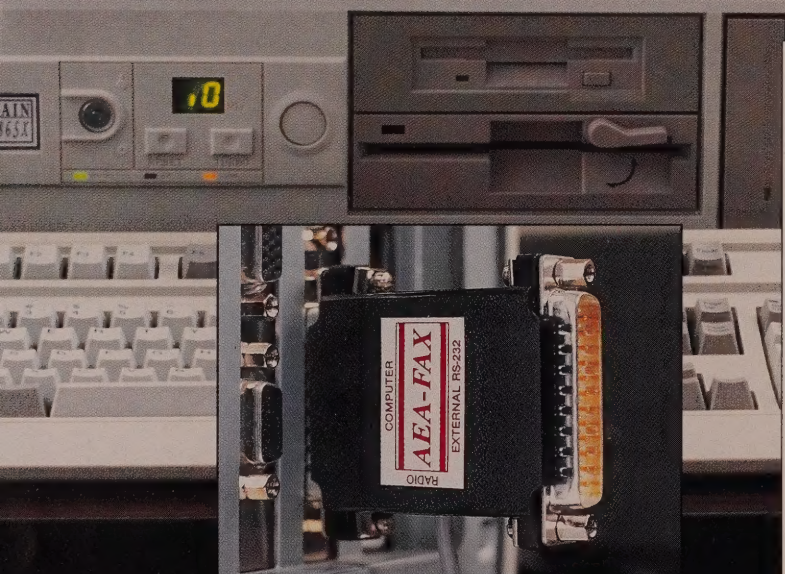


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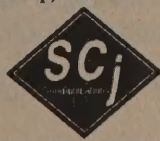
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## The Spec-Com Journal

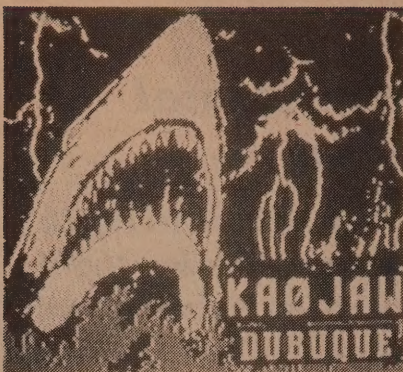
March 1993

*See us at the 1993 Dayton HamVention in Booth # 326 and visit our 8th Annual Saturday Night Specialized Mode Workshop at the Walnut Room of the Ramada Inn North from 7:00 to 10:30*

4	From JAW's jaws by KA0JAW
6	Now The News
9	STS-50 by WA8U & NZ8C
12	Dayton 1993 HamVention
14	USATVS ATV Repeater D/B
16	Another Look at the SLOT
19	Franklin HS Balloon Launch
20	RAIN Focus by KC9RP
24	Central Illinois ATV Dinner
26	Motor Direction Control
28	STS-55 an update
29	Fast Forward by Ron Hranac
32	Getting Started in HRPT by KO4BC
39	Digital Framestore by W8ASF
42	OSCAR 13 & SSTV by WB6LLO
44	Deutsche Welle by KA0JAW
46	FAXCAP
48	RTTY Autostart by WA2OQJ
50	Trunked Radio by KA0JAW
52	The Scanner Report
56	The QRP Corner by W0AV
58	Cathode Glow by AA9DT
60	A Time Remembered by W0AV
63	Spot Light on a BBS
64	Enter Password Please by N8EMR
70	For Sale / Wanted / Trade

The Spec-Com Journal is published six times per year in January, March, May, July, September and November. Issues will be mailed out about the end of each published month. We want and encourage articles from each of you. This journal needs your how-to's, applications and experiences. The Spec-Com Journal (SCj) covers all specialized communication modes.

**Check the Tri-State Data Exchange Special Interest Sections sponsored by The SCj for your use free (other than normal telephone charges). On line 24 hours per day at (319) 556-4536 now with a second line for registered users.**  
A great way to keep in touch and up to date on the latest news, information and software. 1200 to 16,800 baud. Check in today! Now with two lines to serve you better!



## HERE WE ARE AGAIN

Here we are again, another issue due, another deadline to meet. As we put this March issue to press I reflect on the changes that have been made over the last year in our publication. We have expanded our coverage to bring you more information on the events and news of the specialized modes and specialized uses of the modes. I hope you enjoy the new look of our publication and the information presented. I hope to hear from you with your ideas and suggestions for even more improvements. I hope you will tell your friends about our publication and I hope you will share your input with us. That is what the Spec-Com Journal is all about - sharing of ideas and projects with others. Each issue the content mix of our publication changes with the interest of those inputting information. We attempt to touch on all modes but emphasis may sway from issue to issue depending on your input. If your favorite mode is not covered in detail in this issue, stay with us; it will be in future issues. Better yet, send us your input to stimulate discussion. There are many modes to cover and I believe the shifting focus of each issue provides you, the reader with a wide exposure to many interesting and worthwhile projects.

## ATV Data Base

We are in the process of updating the U.S.A.T.V.S. Repeater data base. As you may know, we maintain an extensive data base of operational ATV repeaters and remote bases throughout the United States. We maintain this information to provide a service to our

# FROM JAW'S JAWS

EDITORIAL COMMENT BY MIKE DONOVAN KA0JAW

readers, the FCC and frequency coordinators. The availability of this information can help reduce conflicts and interference. We are also able to provide newcomers to the mode or area up to date information on activity with this data base. We provide this service, free of charge, to you.

It has been some time now since we have totally updated the data in the base. We want to maintain the most recent data we can as a service to you. Later in this issue you will find a "repeater questionnaire" for your use. Copy this form and complete as many of the questions you can about each and every repeater or remote ATV base in your area (or that you know of). I urge you to take the time to return the questionnaire as soon as you can so that we can update the data base. If you

don't know all the information just complete as much as you can. This data base is very important to all of us and we need your input to keep it up to date. Very simply this is a service to you that can be used at any time. Please help us with this major update - don't wait for someone else to do it.

## Share with us

We would like to continue to expand our coverage of the specialized modes and the special use of our communication modes for you. We welcome your input by way of news, ideas, tips and articles for any of the modes, both ham and monitoring, that we cover. The wider the range of input, the better the ideas are. We would really welcome your submissions on a one time or regular basis. We are actively seeking regular authors for Short Wave Utility monitoring with the digital modes, TVRO, Satellite and moon bounce, and other modes. If you or someone you know can share (by writing) with our readers, contact me today. The true purpose of the Journal is to provide a vehicle of sharing. If you are doing a project share it with us so that others can build on the idea and become involved. You really don't need to be an accomplished writer, only have a true love for our hobby and a willingness to share. Don't wait for someone else to do it!

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**(319) 556-4536**

We will be on hand at the 42nd annual Dayton HamVention in booth # 326 and hosting a Specialized Communications Workshop Session on Saturday evening. Stop by our booth to pick up an addenda for the workshop and renew your subscription. Hope to see you there!

# VHF/UHF and ABOVE, ATV FM SSB OSCAR & Weather Satellite from S.I.!

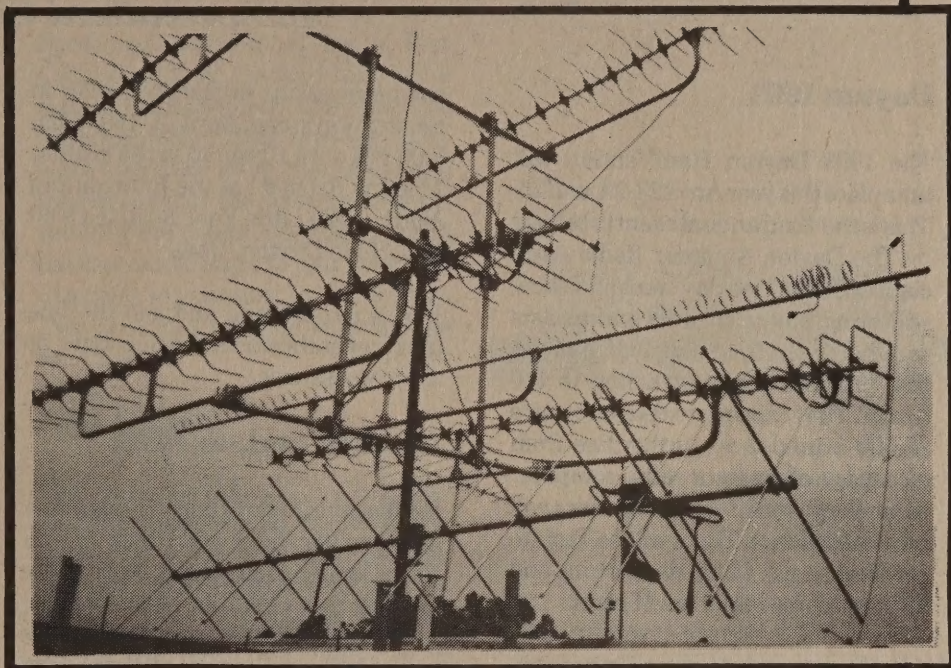
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THIS MONTH'S  
FEATURED ITEMS:

## JAYBEAM

PRODUCTS  
Imported from England

Even in Chile, South America, JAYBEAM PRODUCTS are "DX KING"! Pictured are four stacked UHF 88-element (with H-frame), crossed dual-polarized 10 element VHF and Multi-element Microwave loop yagis beam antennas at the Amateur Radio QTH of Daniel Zavala CE3DZ, Santiago, Chile. Our MBM48/70cm & MBM88/70cm models are ideal for wideband FSTV, 432 MHz SSB or FM mode operations. Stack vertically or horizontally.



### JAYBEAM ANTENNAS

MBM48/70cm 14.0 dBd \$115.00  
MBM88/70cm 18.0 dBi \$160.00  
See our catalog for other models.

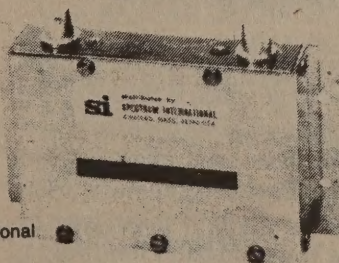
### BANDPASS FILTERS

Clean up your own emitted signal or keep our unwanted QRM! The PSf... series of Interdigital Bandpass Filters are for receiver pre-selector and transmitter use. These custom designed, machined, copper and brass filters are 3-pole, 7% band-width with 0.1 dB ripple design and a 30 dB shape factor of 4:1. The PSf... ATV series of TV Channel Filters are 5-pole, 6 MHz bandwidth design. They are used to protect your TV receiver from inband QRM and to "strip off" the unwanted sideband of your transmitted vestigial sideband signal. Specify frequency range desired.

#### INTERDIGITAL BANDPASS FILTERS

Model	PSf144	PSf220	PSf432	PSf900	PSf1296	PSf691
Freq(MHz)	140-150	216-228	420-450	890-940	1250-1340	1650-750
Loss (typ)	0.1 dB	0.1 dB	0.14 dB	0.2 dB	0.25 dB	0.25 dB
	\$199.00	\$160.00	\$105.00	\$125.00	\$125.00	\$125.00
Model	PSf421-ATV	PSf426-ATV	PSf49ATV	PSf910-ATV	PSf1253-ATV	PSf1280-FMTV
Loss (type)	2.0 dB	2.0 dB	2.0 dB	2.5 dB	3.0 dB	2.0 dB
Std conns.	BNC	BNC	BNC	N	N	N
	\$155.00	\$155.00	\$155.00	\$180.00	\$180.00	\$180.00

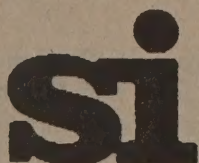
FOB Concord, Mass.



BNC Standard  
TNC or Type 'N' optional

### WEATHER SATELLITE SYSTEMS

We are a USA distributor of TIME-STEP Weather Satellite Image Processing Systems from England. The TIME-STEP WX FAX system is a high-grade, high-resolution, first quality, hardware and software system for the IBM (& clone) computer. Check out this system before making any other purchase! We also have 1691 MHz GaAsFET preamps, receivers, decoder boards, software and antennas as well 137 MHz preamps and receivers and HR PT gear! See our AD for this equipment elsewhere in this issue!



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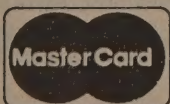
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# NOW THE NEWS

*In Specialized Communications*

## Dayton 1993

The 1993 Dayton HamVention will take place this year April 23, 24, and 25. This is the 42nd annual event to be held by The Dayton Amateur Radio Association. This three day weekend show will bring amateur radio enthusiasts together with equipment exhibitors at the "greatest ham convention in the world". They expect to exceed last year's 32,000 attendance. Authorities from all aspects of amateur radio, computer technology, and hi-tech electronics will be in attendance. There will be Technical Workshops, Contests, Forums and a Giant Three Day Flea Market.

After hours workshops are very popular and educational. According to Bill Brown, of ATVQ one of these workshops you should not miss is the "Q" party to be held from 7:00 PM until Midnight on Friday night in the Grand Ballroom of the Holiday Inn North. Great programs are being lined up for ATV topics.

Another after hours workshop you will not want to miss is The Specialized Communications Workshop that is scheduled for April 24, 1993 from 7:00 until 10:45 PM. This workshop is sponsored by The Spec-Com Journal and The United States Amateur Television Society (USATVS). There is no entrance fee and refreshments will be available.

This year's workshop will include information of interest to all specialized mode enthusiasts including SSTV, WEFAX, Computers, ATV and more. A complete agenda will be available at the Spec-Com Journal HamVention booth #326.

Lynn M. Donovan, Vice President of The Spec-Com Communications and Publishing Group, LTD. has announced plans to host our 8th annual specialized

communications workshop session on Saturday evening, April 24, 1993 from 7:00 PM until 10:45 PM in the Walnut Meeting Room #1 at the Ramada Inn North, 4079 Little York Road (Exit 60 on I-75) in Dayton, Ohio.

Please tell a friend and join the fine group of enthusiasts sharing ideas at these workshops.

## Come by and say hello

While at the Dayton HamVention make sure you stop by and say hello to The Spec-Com Journal gang at booth #326. We will be on hand to visit with you, answer your questions, and accept your subscription or renewal all three days of the event and are looking forward to meeting you. Booth #326 is on the south end of the building near gate F. We hope to have several advertisers and authors on hand from time to time to meet with you. Put booth #326 on your list of things to do at the 1993 Dayton HamVention. This would be a great time to subscribe or renew. We will be accepting both Visa and Mastercard for your convenience.

## Radio Deutsche Welle

In this issue you will find a look at Radio Deutsche Welle which is broadcasting on short wave and television from Germany. We have been informed that Deutschlandfunk programming in foreign languages will be taken over by Deutsche Welle, probably from July 1, 1993. This goes for Dutch, English, French, Danish, Norwegian, Swedish, Italian, and Polish.

## Iraqi RTTY

A message on the Fido Network said that for those with digital decoders, INA / Iraqi frequencies to watch are 13524 and 8049. Standard setting of 50/

425 apply. These frequencies are the best of the usual INA stuff seen during the day and into the late afternoon. 8049 is the Iranian News Agency.

## New RF Power Module Boards

From Tactical Electronics Corporation in Melbourne, Florida; We are releasing our new product, RF power module interface printed circuit boards. For amateurs using RF power modules in building RF amplifiers. The PCB is designed to facilitate the use of the RF power modules built by Motorola MHW series (excluding case 714-04), Mitsubishi M series, Philips BGY series and Toshiba SA series.

The board allows correctly engineered and easy interface from module to RF and DC. The board pads have sufficient space for installation of C and L values, and any required voltage regulators. Board material is .031 glass teflon, usable in most applications to 1.3Ghz. Two versions are available; Model 155A11 fits the MHW and BGY series. The 155A12 is for the M and SA series. Please refer to manufacturer's engineering literature for module technical data. Module suppliers include Richardson Electronics 1-800-797-6937 and RF parts 1-800-737-2787

## STS-55 Postponed Until March

The STS-55 Space shuttle mission has been delayed until mid March. The shuttle amateur radio experiment (SAREX) antenna pattern will be determined using the help of many amateur radio stations and other ground stations.

## Control of your Radio by Telephone

Amateur Radio Engineering, Inc. of Redmond, WA has just introduced HamLink. It is an interface that goes between the telephone line and the computer port of your transceiver or receiver. HamLink can control the frequency of a radio, mode, band, scan, memories, and operate in split-mode. HamLink is even able to share a telephone line with your family answering set without a problem.

With HamLink you can control your transceiver from a touch tone phone anywhere in the world. You can monitor the DX frequencies and work all of the rare ones from your office. If you live in a condo, and can't have an HF station, you can put HamLink at a friend's home or a club station and use it by telephone.

HamLink even has a synthesized voice to announce frequency and mode. You always know where you are operating. With HamLink you can command your radio to go to a specific frequency or you can tune your radio in 10 Hz, 100 Hz, 1 KHz or 5 KHz steps.



HamLink is priced at \$269.00 and is available from your favorite Amateur Radio dealer. HamLink comes with a 1 year limited warranty. For more information contact Amateur Radio Engineering, Inc. P.O. Box 169, Redmond, WA 98073 (206) 882-2837 or Evelyn Garrison at Evelyn Garrison & Associates, 21704 SE 35th Street, Issaquah,

WA 98027 (206) 557-9611 and let them know you heard about this product in The Spec-Com Journal

### TimeStep WEFAX software

Spectrum International, Inc at Post Office Box 1084 in Concord, Massachusetts 01742 is the distributor of the fine TimeStep WEFAX software and hardware (see their ad in this issue) and informs us that the newest version of the software makes it possible to print the captured picture to your printer or to save it to your disk in GIF format. This is a nice addition to their fine software.

### Free Coffee!

The Kentucky Colonels Amateur Radio Club announces its Hamfest/Computer Fest will be held at the national guard armory on highway 231 near the Green River Parkway in Bowling Green, Kentucky. The date will be Saturday April 17, 1993 from 7:00 AM until 2:00 PM. Talk in will be on the 146.25/85 repeater. For more information and advanced registration call Denver at 1-502-777-3681 or write P.O. Box 9781 Bowling Green, KY 42102. Tables are \$5.00 each and admission is only \$4.00 per person. Coffee is Free!

### FAXCAP receives packet

By using a program on the bulletin board systems called TCM3150.Zip and your FAXCAP unit (see our introduction / review of the FAXCAP unit and software that will allow you to receive FAX, SSTV, RTTY, and CW in this issue!) you can now also receive VHF & HF packet.

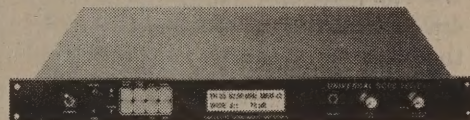
### SCPC Receiver

Universal Electronics, Inc of Columbus, Ohio announced the new SCPC 300-C Audio Satellite Receiver which is now available for shipment.

The SCPC 300-C is a new microprocessor controlled unit that has many new built-in standard features that allow the reception of all types of Single Chan-

nel Per Carrier (SCPC) services.

The receiver is frequency agile, transponder agile and has direct readout on a two-line, super-twist LCD display.



The all new Universal SCPC 300-C is a high-quality, microprocessor controlled audio broadcast receiver, which incorporates every needed feature for broadcast use. There are no costly extra frequency boards needed to put you on any SCPC frequency, as the SCPC 300-C is fully frequency agile and fully transponder agile with a push of a button. No coding schemes are used for selection of its many parameters and features.

The SCPC 300-C has 50 non-volatile memories, which are recalled at the touch of a single button to select any SCPC channel in the set of the 50 to 90 MHz area. Now, one SCPC receiver can receive many SCPC channels with any transmission parameter now in use.

The new SCPC 300-C receiver has two high quality phase lock loop synthesized frequency converters to achieve stable reception. There are two outputs, a 600 OHM balanced line out and a 4 to 8 OHM speaker out, plus front panel headphone monitoring jack.

The input frequency of the unit is 950-1450 MHz and can be used with any modern stable LNB or LNA with a suitable downconverter. The SCPC 300-

C is fully C band and Ku band compatible and furnishes LNB/LNA DC voltage, plus polarity control.

Standard rack mounting of 19" wide, 10" deep, 1.75" high or a standard shelf case cabinet 17" wide, 10" deep, 1.75 high with 115 VAC, 60 cycle power requirements (other power requirements available).

For more information and pricing, call Universal Electronics, Inc. at (614) 866-4605 or FAX (614) 866-1201 and let them know you learned about the SCPC 300-C in The Spec-Com Journal.

## AEA PK-232MBX PACTOR

Advanced Electronic Applications, Inc. now has added a PACTOR option firmware upgrade for its popular PK-232MBX. According to AEA's operational manual, PACTOR is a relatively new amateur data communications mode. It was developed in Germany by Hans-Peter Helfert, DL6MAA and Ulrich Strate, DF4KV. PACTOR combines some of the best features of both AMTOR and packet as well as providing a few new features. PACTOR operates at 100 bps or 200 bps depending on radio conditions. PACTOR also contains a 16 bit CRC to provide near error-free operation as does packet. It can also selectively use a data compression scheme to increase the throughput when transmitting text. PACTOR uses a 8 bit word, allowing use of the full ASCII character set. Most PACTOR operation occurs on the 20 meter amateur band between 14.065 and 14.085 MHz. PACTOR activity can be found on the other HF amateur bands as well and is most often located between 65 and 90 KHz up from the bottom of the band. PACTOR is not sensitive to the

sideband used but it is recommended to use LSB as in RTTY and AMTOR operating modes.

The upgrade of your PK-232MBX is simply installing the two EPROMs in your unit.

Other new features with the February 1993 upgrade firmware includes; PACTOR operating mode, PACTOR maildrop, Experimental packet enhancement for Meteor Scatter operation, TAPR's "QRA" feature that helps new users identify who is on a local packet frequency, ARQTOL command for AMTOR that allows the tolerance of received ARQ bit boundary jitter to be set, a code command has been enhanced to allow for special European characters, a RFRAME command has been added to check for framing errors in receiving Baudot and ASCII.

## Read All About it

The Spec-Com Communications & Publishing Group is please to add the following list of fine books and publications to our sales lineup. We try to provide you with a selection of publications dealing with specialized communications for your reading enjoyment. Now available is:

ATV SECRETS FOR THE ASPIRING  
ATV'er VOLUME 1 FROM ATV Q FOR  
ONLY \$9.95 PLUS \$2.00 S/H,  
THE COMPLETE AMATEUR TELE-  
VISION WORKBOOK FROM QCD  
PUBLICATIONS FOR ONLY \$18.95  
PLUS \$1.50 S/H,

ATV SECRETS VOLUME II FROM  
ATV Q FOR ONLY \$24.95 PLUS \$2.90  
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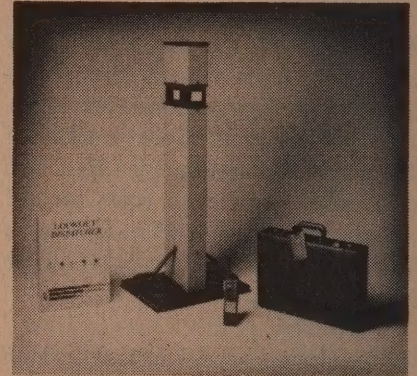
All the above publications in addition to subscriptions (and renewals to The SCj) can be obtained by mailing your check or money order to us at Post Office Box 1002 in Dubuque, Iowa 52004-1002 or with your Master Card or Visa payment (5% service charges applied) by calling (319) 557-8791 from 8:30 AM to 4:30 PM Central time or by FAXING your order anytime (319) 583-6462

We are also pleased to announce close

out pricing on NOMAL's Ham Stuff book, the who-what-where of amateur radio for only \$9.95 plus \$2.00 S/H. Place your order today!

## Security via Cellular

Intellitech Industries of Kennesaw, GA recently announced that its line of Lookout Portable Security products now offers cellular phone capabilities.



The line of products, which transmit voice alarm messages in any language, can now send these alarms to guards or police via telephone, cellular phone or radio, indicting the precise nature and location of the problem. This eliminates the timely process of deciphering sirens and lights.

For information about the Lookout Portable Security Systems products, call Sales manager Chip Esposito at (404) 514-7999 or your authorized Lookout dealer.

## SSTV through RS-12/13

There are several RD-12/13 users who are currently sending SSTV pictures through the satellite in mode KT at 12, 24, and 36 second ROBOT color and AVT 24. The downlink frequency of 29.440 MHz +/- doppler is being used and uplink of 21.240 MHz.

## More SSTV on Satellites

SSTV sessions are held on Saturday and Sundays (UTC) on A0-13 with a downlink of mode B only at 145.960 after OPSNETS that has priority. See more information on this exciting operation later in this issue of The SCj.

**Manufacturers or distributors who wish to have their products or services reviewed by The Spec-Com Journal should send their product samples and promotional materials to us. News releases and club/group announcements are welcome. Let others know what you are doing.**

# SAREX ABOARD STS-50

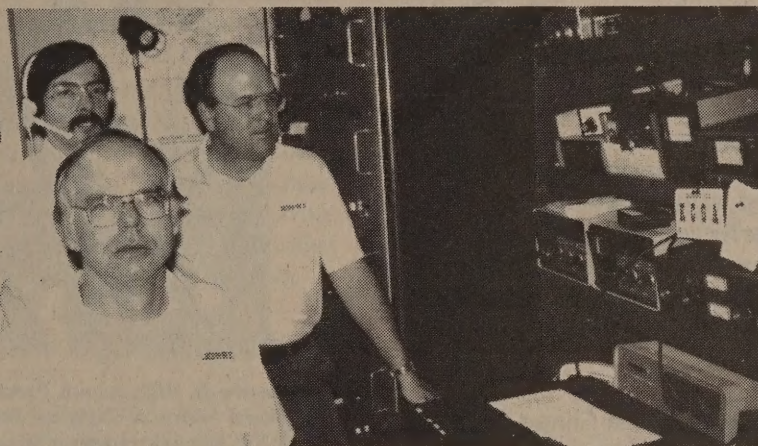
By Tina (WA8U) & Terry (NZ8C) Jones

In July, 1992, select amateur radio stations across the United States experimented with transmission of Fast Scan Amateur Television (FSATV) into space as part of the Shuttle Amateur Radio Experiment (SAREX) on NASA Space Shuttle Mission STS-50. Students and adults alike were thrilled by the chance not only to talk to the astronauts but also to send television to the Shuttle as it orbited our planet. STS-50 was only the second manned space mission that was equipped to receive FSATV. The first was STS-37 in April of 1991, which also carried the SAREX package.

The record-breaking fourteen day mission studied the effects of weightlessness in the first United States Microgravity Laboratory. It was the first in a series of Space Shuttle Spacelab missions dedicated to performing United States research in a low gravity environment. Of the seven astronauts on board, two were ham radio operators, mission commander Dick Richards, KB5SIW, and mission specialist Ellen Baker, KB5SIX.

Six amateur radio stations in the continental United States were selected to participate in the television experiment. Each station had two scheduled attempts to send television signals to the Shuttle during the mission. Unscheduled TV transmission opportunities occurred at other times during the mission. The ground stations were a mixture of NASA center club and private stations. The stations were KC6A, Jim Steffen, of Long Beach, California;

W5RRR, the NASA Johnson Space Center Amateur Radio Club, located near Houston, Texas;



KC6A's shack. Pictured from left to right are Dave Gutierrez, WA6PMX, Jim Steffen, KC6A, and Doug Gilbert, WA6LXB. Behind Doug is the rack of equipment which includes two meter, 222, and 432 Kw amplifiers, and a 60 watt 1296 transverter system. To the right is the equipment console which contains two VCRs used for the transmissions.

N9AB, Andy Bachler, located in Mundelein, Illinois, near Chicago;

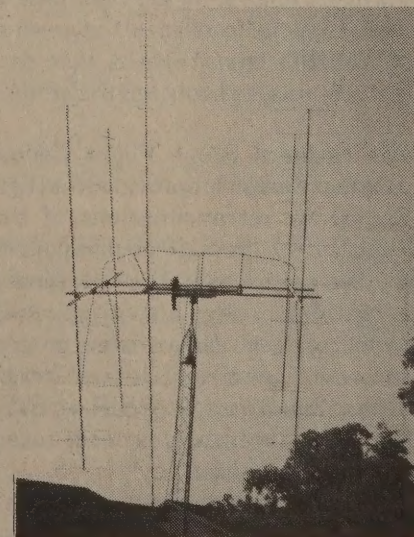
WA4NZD, the NASA Marshall Space Flight Center Amateur Radio Club, in Huntsville, Alabama;

WA3NAN, the NASA Goddard Space Flight Center Amateur Radio Club, in Greenbelt, Maryland;

and KE4PT, Kai Siwiak, located in Pompano Beach, Florida.

Andy Bachler, N9AB, in Mundelein, Illinois, designed the amateur television package for SAREX. The flight hardware package used during STS-37 was modified for improved performance without adding to its size, thanks to contributions made by Fred Reimers, N9ATW, of FAR Circuits, and Al Lowenstein, K7ATM, of Motorola Ceramic Products Division. The dual band antenna was modified to operate in a window different than the one for which it was originally designed with the help of Jerry Coles, KB5ARA. Coles

also developed an in-flight maintenance procedure which enhanced the 2 meter signal quality when problems arose early in the mission. In the words of SAREX team member Kai Siwiak, KE4PT, "Three cheers to Jerry for doing a hero's job on a tricky antenna redesign problem!"



The antenna array used by station KE4PT in Pompano Beach, Fl. for making the SAREX ATV Contacts.

Transmission material from Bachler's station consisted of a video tape of the antenna and shack, a tape of students who had built "space habitats" and participated in space simulations earlier in the year, and live video with superimposed station identification to introduce the tapes. Even though the maximum elevation of the Shuttle above the horizon when viewed from Bachler's station was only four degrees, Commander Richards reported that these signals were visible aboard the orbiter. Reviewing the tape of received signals showed that Commander Richards was treated to a brief, but clear view of the very impressive antenna array (16-bay, 21-element Quagi) Andy used to send him the video!

The Johnson Space Center Amateur Radio Club coordinates all SAREX activities. John Nickel, WD5EEV, Club President for 1992, and Lou McFadin, W5DID, are the CoPrincipal Investigators for SAREX. Members of the Johnson Club and AMSAT operate positions in the Customer Support Room at Mission Control around the clock during these missions. Brad Smith, KA5CDJ, and Jerry Coles, KB5ARA, led Johnson's FSATV portion of STS-50 SAREX. Gill Carmen, WA5NOM, provided orbital element updates to the world during the mission. Following the flight, analysis of the video tape of received signals confirmed that several of W5RRR's transmissions were successfully received onboard the orbiter.

The Goddard Space Flight Center Amateur Radio Club provided the High Frequency retransmissions of the Shuttle air-to-ground transmissions as they have previously. They also coordinated all telebridge activities linking participating schools to amateur ground stations in Hawaii and Corpus Christi, Texas. Ron Parise, WA4SIR, an STS-35 crew member, coordinated Goddard's activities.

On the first of two scheduled passes, the Goddard amateur television team, led by Chuck Sommer, N4OSD, and Bob Burninga, WB4APR, transmitted a videotaped greeting to crewmember Ellen Baker, KB5SIX, from her mother.



**Lakeside Jr. High School.** Pictured from left to right are the students Kelly Laswell, Richard Andrade, Christine Ramos, and Gloria Moya. Also pictured is Sheila Bird, N6LXW, who is in charge of the school's ham radio club. Sheila made the contact with the shuttle from the school while the students showed their video demonstrations of Newton's third Law and asked questions on how their experiments would perform in micro-gravity.

On their second pass, they uplinked a weather report for landing day done by none other than Willard Scott. A brief segment from the first uplink attempt, with the WA3NAN callsign superimposed on the images, was captured on the onboard videotape after Richards and Baker returned to earth.

Jim Steffen, KC6A, of Long Beach, California, previously made history during STS-37 by becoming the first to transmit FSATV video to a manned orbiting spacecraft. Building on this success, he used the first of his two scheduled passes to carry out a contact between the Shuttle crew and local middle school students. His team selected ten schools within ten miles of his home shack from a list provided by Rosalie White, WA1STO, manager of the ARRL Educational Activities Department. They chose Lakeside Junior High, and asked Wanda Shaffer, N6LXW, a science teacher there, to come up with a project that could be demonstrated by her students in two

minutes. They decided to demonstrate Newton's Third Law ("For every action there is an equal and opposite reaction") using some coins and a Newton's Cradle. The tape of the experiment was transmitted to, and for the most part,

received onboard the shuttle. ATV transmissions were relayed directly from the school to Jim's shack via a 1.2 Ghz link, while the the students spoke directly to Commander Richards over a 2 meter link directly from the school. Nearly the entire contact was visible on the video tape of received signals as they asked Commander Richards how the steel balls would react in microgravity, and how much force it would take to move the first ball. Portions of the ATV audio were audible on the videotape, while the entire contact over the two meter frequency was perfectly clear in both directions.

It was a very successful contact for the students. They learned first-hand from an astronaut traveling in space that where he was, only a very special Newton's cradle would keep the balls in line, since in space things tend to fly apart. When the contact was over, the audience stood and cheered! The contact appeared at least five times on the news that night, and in at least three newspapers, including the Los Angeles Times.

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In addition to Wanda Shaffer and Dave Gutierrez, many others contributed to the success of the contact, including Doug Gilbert, WA6LXB; Wayne Overbeck, N6NB; Jim Porep, KC6TFV; Tom O'Hara, W6ORG; Sheila Bird, N6LXW; Dave Bird, AA6DB; John Levin, KM6JV; and Doug Tice, KK6OU.

With the help of Roy Neal, K6DUE, Jim also obtained a video tape of a short monologue prepared specially by Jay Leno for the crew. Leno had agreed to prepare the routine upon learning that Commander Richards is a big fan of his. (Leno asked the crew if they were still drinking Tang!). Nearly all of the video and portions of the ATV audio sent by Jim were successfully received. The audio was also transmitted over the two-meter coordination frequency as a backup.

Kai Siwiak, KE4PT, of Coral Springs, Florida, and Andrew Rusnock, WB4BKC, assembled a "field day-like" station in Pompano Beach, Florida. The KE4PT operation used WB4BKC's moonbounce antennas, which, unfortunately, was later destroyed by a tornado. Commander Richards, said that theirs were the loudest signals heard on 2 meters! They also had voice contact with Mission Specialist Baker on one orbit. Their transmissions consisted of mostly taped material in addition to participating in transmitting the Jay Leno tape. An image of the SAREX shield logo was clearly visible on the tape of received ATV signals.

Terry Jones, NZ8C, of the Marshall Space Flight Center Amateur Radio Club (MARC) coordinated the FSATV portion of the mission. Because two or three ground stations shared each of five dedicated passes over the U.S., it was necessary to make sure that only one station transmitted at a time. Jones established transmission schedules and updated them throughout the mission to keep up with changes in the Shuttle's orbit. During a pass, Jones and other MARC members coordinated the transmissions of the ground stations from

the club's shack at the Marshall Space Flight Center.

The Marshall Club also used one of their two passes to provide area students an opportunity to talk to and, hopefully, be seen by Commander Richards. Three students each from two area schools and the Huntsville, Alabama Boys' and Girls' Club came to the club shack for the contact. Each group had one question for Commander Richards. The question and answer session with the young people went very well on the two meter voice coordination frequency. Unfortunately, none of the FSATV transmissions from WA4NZD could be positively identified on the tape of the received signals.

Other MARC members involved were Don Hediger, N4MSN; Tina Jones, WA8U; Larry Savage, WA4CAX; Brian Kirby, KD4FMN; and Gene Marcus, W3PM.

Although the FSATV team had high expectations of the STS-50 mission, reports from the crew during the mission and post-flight debriefings were cause for concern. During the flight, problems with the SAREX antenna forced all two meter operations, including random QSOs, onto the frequency set aside for FSATV coordination. Correcting the antenna problems saved most of the 2-meter operations, but appeared to adversely affect the FSATV reception. Additionally, due to the nature of the experiments in the Microgravity Laboratory, the shuttle flew with its tail down and payload bay forward. This antenna was located in one of the overhead windows. These two factors meant that the body of the orbiter blocked the signals from the ground once it had made its closest approach to the ground station. This cut the useful part of a pass down to only the first half, from the time when the orbiter first appeared above the horizon to the time it was highest in the ground station's sky.

However, analysis of the video tape of the received signals onboard the or-

biter showed much more video was received than originally thought. Some of this video was accompanied by clearly understandable audio and full color. According to Bachler, "The Houston SAREX team...made gallant attempts to raise our spirits by acknowledging the work and contributions that the FSATV team made...The outstanding success of the transmissions was not realized until later when the STS-50 FSATV tape was reviewed back on earth."

The FSATV team is now preparing for the next shuttle flight that will carry the SAREX FSATV package. This is planned for STS-56, currently scheduled for launch in late March, 1993. A two-element beam to improve reception is presently undergoing flight certification, and all stations are preparing their stations and transmission materials using information gathered and lessons learned from the previous two SAREX ATV flights. With the 57-degree inclination orbit of STS-56 and variable spacecraft attitudes providing the best pass opportunities yet for a SAREX ATV flight, the team is optimistic that high quality signals will be consistently received onboard, proving ATV's place in manned space amateur radio communications.

For STS-50, it was as it is with so many ham activities. After all the preparation and sometimes frustrating, hard work beforehand, and the tense moments just prior to establishing contact, everyone felt rewarded just by the sound of their call signs returning from fellow hams travelling in space!

**Please share with others by sending your postcard, letter, or copy of your newsletter (with reprint permission) to us.**

# Dayton 1993 HamVention

The 1993 Dayton HamVention should be bigger and better than ever. Here is a rundown of events for the HamVention. All of these are subject to change so make sure you check the schedule of all events you want to hit when you get to Dayton. Remember, The Spec-Com Journal will be in booth # 326 so stop by and say hello.

For more information, call (513) 454-1456.

Talk-in is on 146.94-, 146.91-alternate. Also, 223.94- and 442.1+, and 530 kHz AM.

## Friday, April 25

0800-1800 Flea Market open  
0800-1800 Busses run  
1200-1800 Exhibits open  
1300-1700 Forums

### Forums:

AMSAT International  
Hungarian Amateur Radio Club  
Packet Radio  
Prodigy  
Antennas  
Electrical Safety Demonstration  
County Hunters  
Ham Radio in the Classroom

### Unofficial Functions:

Tours of VOA Bethany Relay Station  
B\*A\*S\*H (Miami Valley FM Association)  
QCWA Dinner DX Dinner  
North Jersey DX Association  
National Packet Round Table  
Far Out A.R.C. Hospitality Blitz  
Western New York DX Association  
The "Q" Party (ATVQ ATV Session)

## Saturday, April 24

0600-1700 Flea Market open  
0600-1700 Busses run  
0800-1700 Exhibits open  
0900-1700 Forums  
1930 Banquet (Speaker: Cliff Stoll, K7TA)

### Forums:

DX  
ARES  
WX Satellite  
Combined MARS  
UHF/VHF  
Electrical Safety Demonstration  
OSSBN Youth in Amateur Radio  
Ohio Army MARS  
Digital Digest Slow  
Scan TV  
Firebirds  
Wayne Green  
Contests  
Amplitude Modulation  
Media Forum  
YLRL  
Fast Scan TV  
AMSAT  
Repeater Database Coordination  
QRP "Homebrewing and History"  
10-10  
MID CARS  
Transmatches  
Geratol Net

### Unofficial Functions:

Amateur Radio Flying Boat Society  
10-10 Paper Chasers  
SPEC-COM Specialized Communications  
Weather Satellites / Remote Imaging  
Western New York DX Association  
North Jersey DX Association

## Sunday, April 25

0600-1600 Flea Market open  
0600-1700 Busses run  
0800-1400 Exhibits open  
0930-1400 Forums  
1400 Prize Drawings

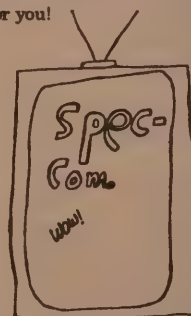
### Forums:

ANARC Scanner / Shortwave Listeners  
Bicycle Mobile Hams of America  
The Westlink / Newline Story  
Electrical Safety Demonstration  
ARRLNEC - Using the Big Antenna Analysis  
Amateur Radio and The Law  
Station Grounding for Lightning

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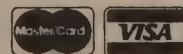
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# SPEC-COM JOURNAL / USATVS FAST SCAN ATV REPEATER (REMOTE BASE) REGISTRATION FORM 1000-93



System is: ☐ Inband repeater (rcv/xmit same band) ☐ Cross band repeater ☐ Remote transmitter

Location of system \_\_\_\_\_

Call Sign of system \_\_\_\_\_

Transmitter output frequency \_\_\_\_\_

Transmitter antenna Polarization \_\_\_\_\_

Transmitter power (average) \_\_\_\_\_

Transmitter HAAT \_\_\_\_\_

Transmitter elevation ASL \_\_\_\_\_

Type of audio transmitted ☐ 4.5 MHZ FM Subcarrier ☐ On-Carrier ☐ Other

Key-up method ☐ VOR ☐ COR ☐ Touch Tone

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Sponsoring club or group net \_\_\_\_\_

Receiver antenna polarization \_\_\_\_\_

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Local FM "Chat" frequency used for ATV activity (note if simplex or repeater) \_\_\_\_\_

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Submitters name, address, phone \_\_\_\_\_

**Return this form 1000-93 to The Spec-Com Journal, Post Office Box 1002,  
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**This is an open letter to all SCj readers and ATVers - Please copy this letter and the form 1000-93 on the back, pass it on to your news letter or other publication to help build the data base.**

## **Revised ATV Data Base**

We are in the process of updating the USATVS/SCj Repeater data base. As you may know, we maintain an extensive data base of operational ATV repeaters and remote bases throughout the United States. **We maintain this information to provide a service to our readers, the general public, the FCC and frequency coordinators.** The availability of this information can help reduce conflicts and interference. We are able to provide newcomers to the mode or area up-to-date information on system activity with this data base. **We provide this service, free of charge, to you.**

It has been some time now since we have totally updated the data in the base. We want to maintain the most recent data we can as a service to you. Attached you will find a "repeater questionnaire" (form 1000-93) for your use (back of this letter). Copy this form and complete as many of the questions you can about each and every repeater or remote ATV base in your area (or that you know of). **I urge you to take the time to return the questionnaire as soon as you can so that we can update the data base.** If you don't know all the information, just complete as much as you can. We will compare the information you give us with what is on file in our computer. This data base is very important to all of us and we need your input to keep it up to date. This information is not used for any subvert purpose nor is this a profit making project. **Very simply, this is a service to you and all interested in ATV. Please help us with this major update - don't wait for someone else to do it!**

Use a separate form for each system. Don't feel you need to restrict information to only the system(s) you are involved with or use. If you know of a system in your area, where you travel, where your buddy lives or whatever, pass it on to us. A little information from you is better than none and will give us a starting point to research needed details.

If the information from this data base can be of help to you or your group please let us know and we will provide you, free of charge with the records you are interested in. **We also will be placing the updated data base on the Electronic Cottage Telephone BBS (319) 556-4536 for your reference and record look-up when it is complete.**

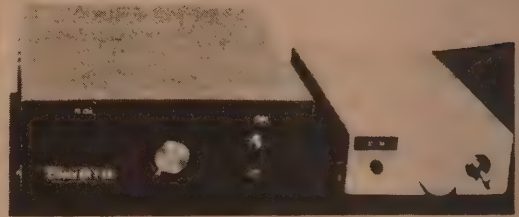
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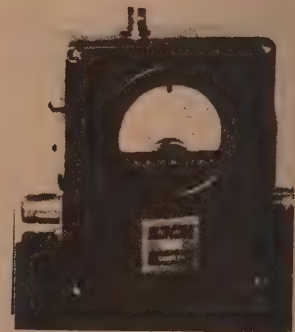
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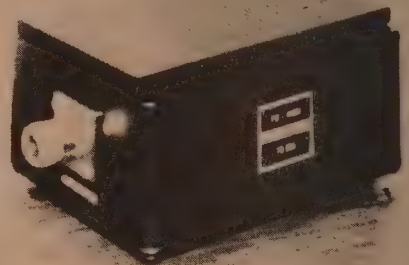
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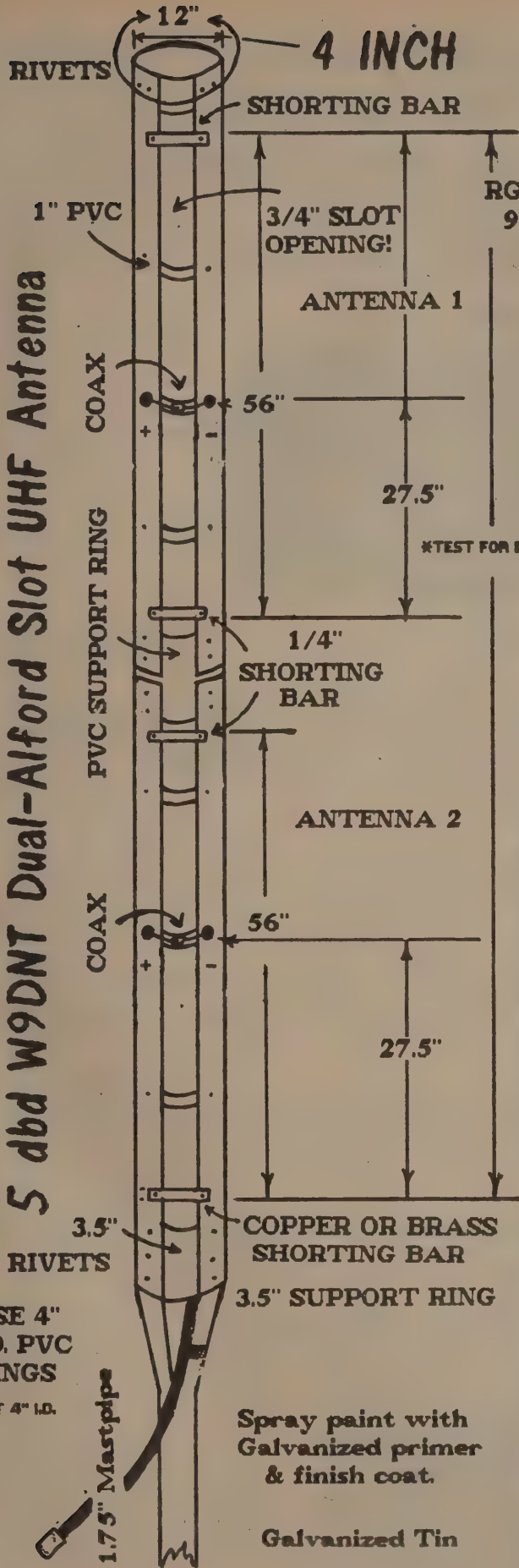
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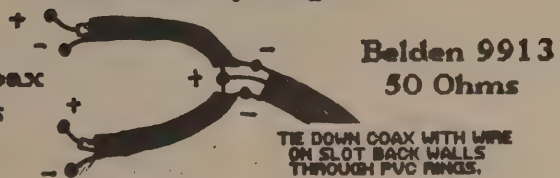
**See Us at Dayton Booth #319**

HORIZONTALLY POLARIZED, OMNI-DIRECTIONAL 70 CM.

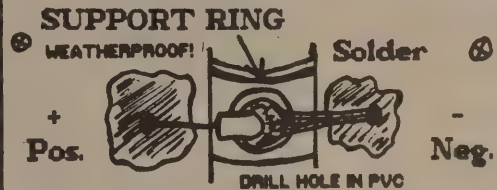
# 5 dbd W9DNT Dual-Alford Slot UHF Antenna



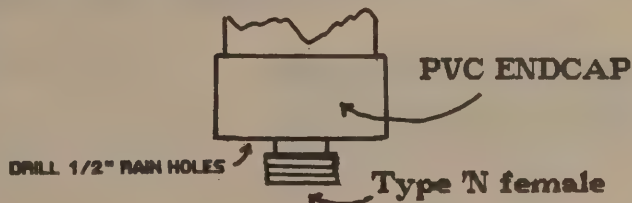
93/50 OHM RG62  
Phasing Harness  
Equal lengths. 50 Ohm  
feed line any length.



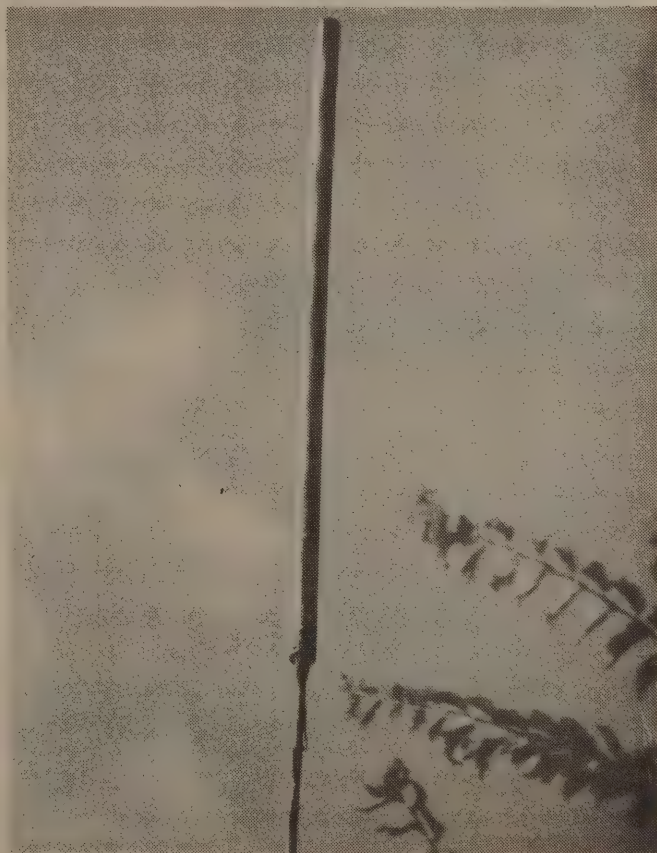
## Closeup View of Coaxial Connection



## Alternative End Connector Hookup



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W9DNT DUAL-SLOT ANTENNA AT KBOCAQ ATVR IN MAQUOKETA, IOWA

# AMATEUR TELEVISION EQUIPMENT

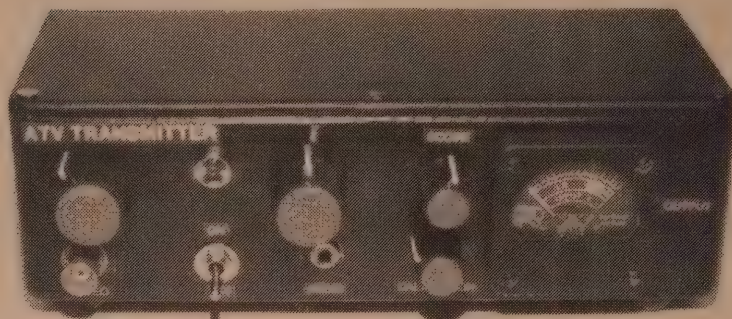
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# Franklin Community High School Balloon Launch

*Twice a year in April and October Franklin Community High School in Franklin, Ind. has a balloon launch. We thank Chuck Crist WB9IHS who is the project Director for this information and continuing updates of the project. This type of activity combines our hobby with the learning process and facilitates the amateur and monitor participation.*

## Franklin Community High School Balloon Launch

On April 10, 1993 at 0700-0800 AM EST a group of High School Aerospace technology students will launch a helium filled ten foot diameter high altitude balloon to study the atmosphere and simulate their own satellite program.

Twenty FCHS students will be assisted by amateur radio operators from central Indiana and many sponsors, among which are NAWC, FAA, GARMIN GPS and AVEX power systems.

The project goals include atmosphere temperature studies, GPS tracking, communications with other Mid-West high schools and FAA radar tracking problems. The high altitude balloon will depart early on Saturday morning and travel east to a predetermined landing carried only by the wind. The balloon should reach altitudes of approximately 140,000 feet and stay aloft for two to three hours, allowing participants to use all the onboard electronic systems.

Satellite electronic systems will include live TV pictures, communication equipment and GPS data linked down to participating schools. This project is one part of the FCHS Aerospace Tech-

nology class curriculum providing students with exposure to Aerospace through "hands-on" applications.

For more information contact Mr. Doug Graig at Franklin Community High School, Grizzly Cub Road, Franklin Indiana 46131.

## RADIOAFICION MICROCOMPUTACION

Es una revista escrita en idioma español que se publica desde hace más de una década y circula en todos los países, desde los Estados Unidos hasta la Argentina. También en Brasil y España. Contiene cuando interesa al radioaficionado, desde la categoría de Novicio hasta la más alta en materia de comunicaciones terrenas y satelitales. En sus páginas se desarrollan temas escritos en forma didáctica por los más prestigiosos autores. La revista tiene además un formato digital y su texto puede leerse, imprimirse y estudiarse con una computadora y un modem recurriendo a los servicios que junto con muchos otros como la correspondencia electrónica, noticias de todo el mundo por las principales agencias, etcétera presta:

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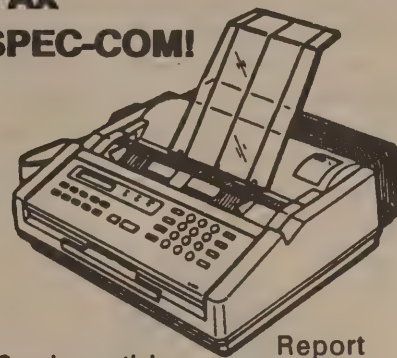
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# RAIN Focus by Hap Holly / KC9RP

## Keys to A Successful Hamfest, Part 2

For many radio clubs hamfests are THE major source of income with which to finance local activities. But just what makes a hamfest successful? One man who knows is Kevin Karamanos/W6DIIH, National Sales Manager for Yaesu USA Amateur Product Division



in Cerritos, CA. He attends some 25 hamfests annually, both as a vender and as a ham. The following is a continuation of an article based on my interview with Kevin, in which he shared some of his observations regarding hamfests.

## DEALER INVOLVEMENT

"If yours is a small to medium-size hamfest, you need at least one dealer there. One of the tricks of the trade is to offer a dealer a discount in the cost of booth space. If he or she buys 3 tables or donates a low cost handheld as a prize, throw in a 4th table free. If the dealer isn't interested in donating a prize, contact the manufacturer. Whether a manufacturer attends or not, maybe it would offer a product for

a prize at a discount as long as it knows the raffle is not going to someone specifically. Most of the manufacturers today, either direct or through a dealer, will offer a %35 discount off the retail price for hamfest drawings.

"As to how many prizes a hamfest should give away, that depends on the size of the show. A smaller show can't offer prizes hourly, but may opt to raffle discount coupons. Most 1 or 2-day shows give the grand prize at the end of the day. That doesn't always work, especially during a 2-day show because by Sunday afternoon, everybody's gone home. Therefore, the winner has to be notified the next day by phone or by mail. I recommend that regardless of how large the hamfest is, offer a prize to the 500th person passing through the doors, or draw a prize a couple of hours after the doors are opened. That's a great way to create excitement instead of having to wait 'til the end of the day. Even if you can't have a drawing every hour, a couple of drawings during the day will generate some excitement—it's much more fun to win a prize and be there to take it home. Staggering the drawings will keep people guessing, and keep them around longer to perhaps buy something else from a dealer or at the flea market.

"Here's another point to consider: Most shows I go to start at 9 AM. Unless you've got a lot of good forums and talks, the locals who arrive at 9 o'clock, meet up with their friends, and leave 3 or 4 hours later. I hit the flea market right away for those bargains. About 10 or 11 o'clock, I'll hit the show. By holding the prize drawing at, say, 3 o'clock, you'll perhaps keep more people like me there longer."

## ATTRACTING DEALERS

"Whether they travel 1 or 200 miles, a dealer likes to go to hamfests, especially if they're the only ones there. Dealers overall will go to any show if you invite them if they don't already have some other show to go to that same weekend. But there is a catch. I attended a hamfest not long ago at which the last couple of years, there have been a dealer or 2 that have done very well saleswise. This year, though the show had only grown a little, the sponsoring club invited 2 more dealers, bringing the total at this year's show to 4. All 4 were disappointed. Now the sponsor of that hamfest cannot find ANY dealers to commit to the show for next year. You get to the point to where you have to balance supply and demand. I would say for a show that draws LESS than 3,000 people, one dealer is enough; 2 dealers for 3,000 to 5,000 people. Remember the dealer has to justify driving or flying out to the show with a crew; setting up and paying for the booth, hotel room, and food. They need to make a profit in addition to paying all their expenses when they come out to your show."

## CRITERIA

"For a dealer or manufacturer, it's always a gamble attending a hamfest for the first time. As far as Yaesu is concerned, if we have a show that we're really thinking about attending, I will talk with the dealers or manufacturers that have gone there in the past. If none of them have attended, I or one of my staff may go out to view the show in person. It's very rare that we'll take an application or letter asking us to go to a show and just show up because our complete booth is in giant crates and is moved by a moving company that sets up their schedule well ahead of time.

"Whenever you invite a dealer or manufacturer to your show, you need to mention what the approximate number of people you hope will attend or have attended in the past. If the numbers check out, there's a good chance we might go.

## FORUMS

"I suggest you limit forums to 50 minutes, allowing an additional 10 minutes for people time to clear out before the next one. If you go longer than an hour, people will tend to come and go, making the speaker uncomfortable. As far as types of forums, go with the basics.

People like to see how to build an antenna; manufacturers like to have some time to "show and tell" about a new product that is difficult to do in a booth when you've got people gathered around. You can get guest speakers. There's always some kind of a star living nearby that would be willing to talk for a few minutes if asked. Usually speakers will come out for next to nothing costwise just because they enjoy talking to local hams. You might try getting speakers from the weather service or area SkyWarn program. Surprisingly, you can even get people from the nearest FCC field office to put on a short talk about licensing, enforcement, and so on. Put on 3 or 4 forums on a program, and boy it really makes for a big draw, especially when they're free.

## ALTERNATE ACTIVITIES

"I've got a 4-year-old son, who goes with me to some of the shows now. For the first hour or 2 he enjoys the show. He then gets to the point to where he doesn't know what he's going to do the rest of the day. I'd like to attend the rest of the show, but you've got to find something for the kids and spouses to do. And remember, non-ham spouses today aren't necessarily the wives!

"An alternate activity could be something as simple as providing a local buss trip or van hourly to local shop-

ping malls. This will give the spouse the opportunity to get some shopping done he or she wouldn't otherwise have the chance to. In addition, they won't feel so guilty leaving their spouses at the hamfest. Some of the progressive shows have paid people to come in and provide child care. Yes, that is a little more complicated, however, if parents bring their kids to the show knowing they'll be taken care of, it will give mom and dad a chance to freely roam around the hamfest an hour or 2. Most shows have some sort of special activity in the area, whether it be at Disneyland in Anaheim, CA., Six Flags' Great America near Chicago, etc. Organize some small trips and offer them to your hamfest participants, and you may bring an additional %10 to %20 more draw than you expected."

## INSURANCE

"You do have to cover yourself, especially if you're a ham club. Most fair grounds will require you to purchase an insurance policy. Usually the policy is only good for 72 hours, so the cost won't be as bad as you might think. If you plan to hold your hamfest at the local fair grounds, ask them ahead of time just what policies are required. Go shop a couple places for the best price, then have the policy written up for you. Make sure your insurance covers the setup and teardown periods because that's when most accidents happen—the Friday night before the show, and the Sunday night when everybody is rushing to leave. Contrary to what you might think, usually the exhibitors or people in the flea market are the ones that hurt themselves trying to rush their gear in or out of the show."

## STARTING FROM SCRATCH

"If you want any of the large manufacturers to attend your club's first-time hamfest, here are some suggestions. Give us the date of the hamfest, and the ball park attendance of what you expect, whether that be 200 or 2,000 people. Most manufacturers (including Yaesu) will provide literature and

catalogs for your hamfest. Many will provide special pricing. In your invitation to XYZ manufacturer, ask if there are donations of equipment or special pricing available for your First-time event. Above all, offer some promotion items. Since it's your first time at holding a hamfest, promote a drawing for a free handheld, mobile rig, or antenna. Such drawings will help attract those who might otherwise be hesitant to drive a few extra miles to attend your hamfest.

"If you have a question about the keys to a successful hamfest, I can be reached in Cerritos, California at Yaesu USA at (310) 404-2700. As I travel a lot, leave your name and number and I'll gladly call you back when I'm in my office. If I can make your hamfest a little better, so much the better."

*For an audio tape of this interview, send \$1.00, a 90-minute cassette and an SASE or free matter mailer. Specify you want RAIN Supplement tape #1.*

*The RAIN Journal is a bimonthly 90-minute cassette ham radio magazine consisting of interviews and commentaries produced for the RAIN Dialup (708/299-INFO). Recorded with the blind ham in mind by a blind ham, (but of interest to all ham radio enthusiasts), this magazine is feature and editorially-oriented. You'll hear the actual voices of columnists, and of those interviewed. It has no editorial bent. In fact, Hap Holly/KC9RP, RAIN Journal editor, rarely editorializes at all. While he is a member of the American Radio Relay League (ARRL), Holly does occasionally include an interview or commentary critical of it. Incidentally, RAIN (Radio Amateur Information Network) receives no funding other than an occasional individual donation.*

*To receive the 1993 demo cassette of the RAIN Journal, send \$2.00 and a free matter mailer or SASE. If you send an SASE, attach 3 ounces of postage to your outgoing envelope, and 2 ounces to your SASE.*

*Subscriptions to the RAIN Journal run*

January through November, \$2.00 per issue. To subscribe send a check for \$12.00 (if you want all six issues that will be produced during 1993). Otherwise, prorate your check accordingly, and follow the above mailing instructions. For your convenience a "free matter" mailer and reusable address card are available for an additional \$5.00.

Make checks payable to RAIN, PO Box 2565, Des Plaines, IL 60017-2565. 73, de Hap/KC9RP @ N9HSI.IL.USA, Voice Mail: 708/518-6551.

## NOTICE TO DAYTON HAMVENTIONERS:

Be sure to drop by booth C1 (located between forum rooms 1 & 2) and say hello to Blair Alper/KA9SEQ, one of the voices of the RAIN Dialup, and President of LTRN, the Let's Talk Radio Network. LTRN will be uplinking audio from various forums, Saturday, April 24th, and Sunday morning, April 25th on Spacenet 3, Channel 21, 5.8 MHz wide band audio. I'll also be in booth C1 representing RAIN, and will have some handouts promoting the RAIN Journal. We both look forward to see you at Dayton.

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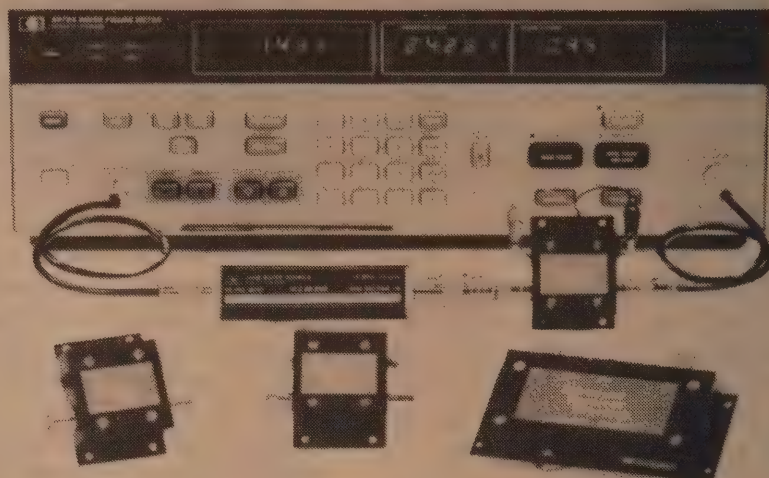
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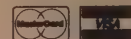


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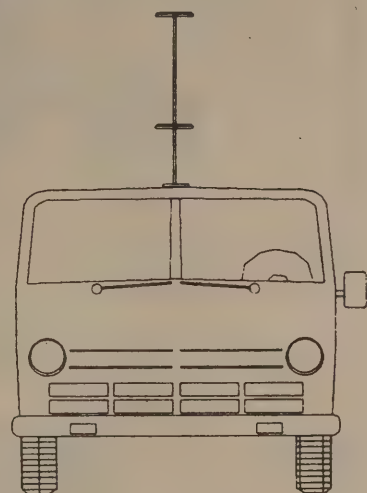
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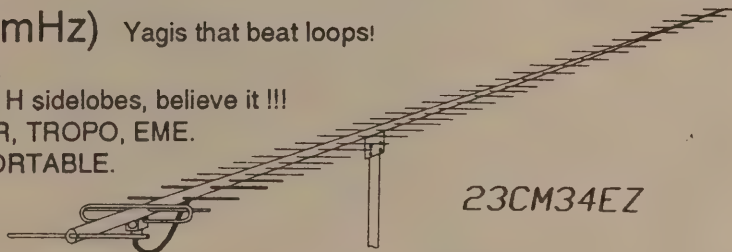
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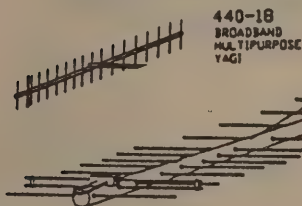
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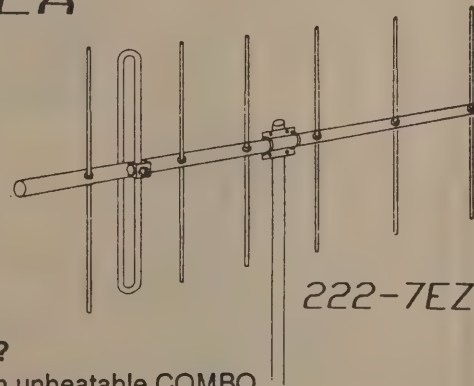
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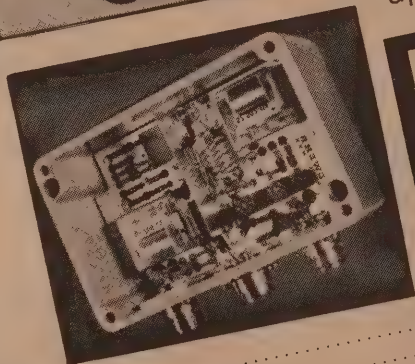
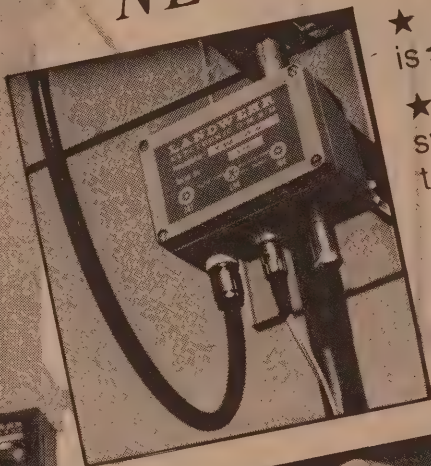
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750 Watt  
Type N

**432 MHz**  
430-450 MHz  
F < 1.1 db  
typ. 0.9 db  
17-19 db  
150 Watt  
350 Watt  
Type N

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# SIXTH ANNUAL ATV DINNER

*The Sixth annual ATV Dinner was held late last year in Litchfield, Illinois. Due to our schedule we were unable to bring you the information in our January issue but felt the information was interesting and worth while. We invite your sharing of information with the readers of The SCj and look forward to all your submissions.*

As the Christmas holidays approached one event that is eagerly anticipated is the Central Illinois - St. Louis, Missouri area annual ATV Dinner. This year was no exception with another new record of people attending from as far as Sidney, Australia. As in years past the event was held at the Ariston Restaurant in Litchfield, Illinois.

The group started to assemble at 5 P.M. for happy hour, to make new acquaintances, and renew old friendships. The room which was decorated in holiday attire with some special decorations by WB9QLY and niece Amy Bishop.

various tables and holiday music reinforced the congeniality of the atmosphere. Many pounds were gained that night from the specialty of the house, Prime Rib, other menu specialties, and those famous Ariston desserts.

The program began with the awarding of several special awards for special events during the past year. This year KD0LO, KD9CN, and KB9DU were given the awards for humorous incidents that they were involved in. A special award, The Order of The Antenna were presented to KD9CN, K9RRP, WD9ENR, and N9NEP for their help with K9SM's recent antenna addition and their hours of dedication on a cold November day.

This years' award for Central Illinois / St. Louis Area Amateur Television Operator of the Year was given to K9KKL, Bill Bryant, from Springfield, Illinois.

help through the years with his expertise. He has also attended all of our dinners and helped with the Old Settlers parade since its beginning. His help and guidance has been appreciated through the years by all in the group. Thank you Bill!

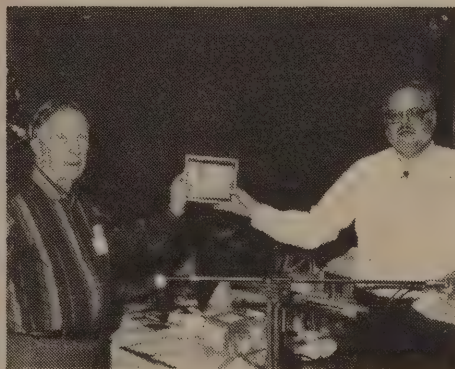
Next on the agenda was the program. This year Ben Kiningham K9IDQ gave an interesting talk about his job with the Illinois News Network. Ben covers the statehouse in Springfield and told us on how the network operates as well as some humorous out takes on tape from those not aired.

The program concluded with the famous double draw for prizes donated by many generous contributors. Everyone looks forward to the drawing and the chance of winning anything from a magazine to a new downconverter or antenna. The children draw the names and the lucky person draws a number which corresponds to a number attached on a prize. As the drawing came to an end the program was concluded and everyone said their farewells and holiday wishes and went their merry way. A good time was had by all and everyone looked forward to next years dinner.



Picture of the group at the Ariston Restaurant in Litchfield, Illinois 1992

At 6:30 K9SM called the dinner to order. Cindy N9GNZ offered prayer and the clatter of dishes and instruments blended with chatter from the



Pictured is Bill Bryant K9KKL receiving the Central Illinois / St. Louis Area Amateur Television Operator of the Year - 1992 award from Scott Millick K9SM. K9KKL is on picture left and K9SM on picture right.

Bill is an early ATV pioneer in this area and has given a lot of assistance and



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# Motor Direction Control

Motor Direction Control (From 12 Volt supply) by Bob Spahn of Metairie, Louisiana.

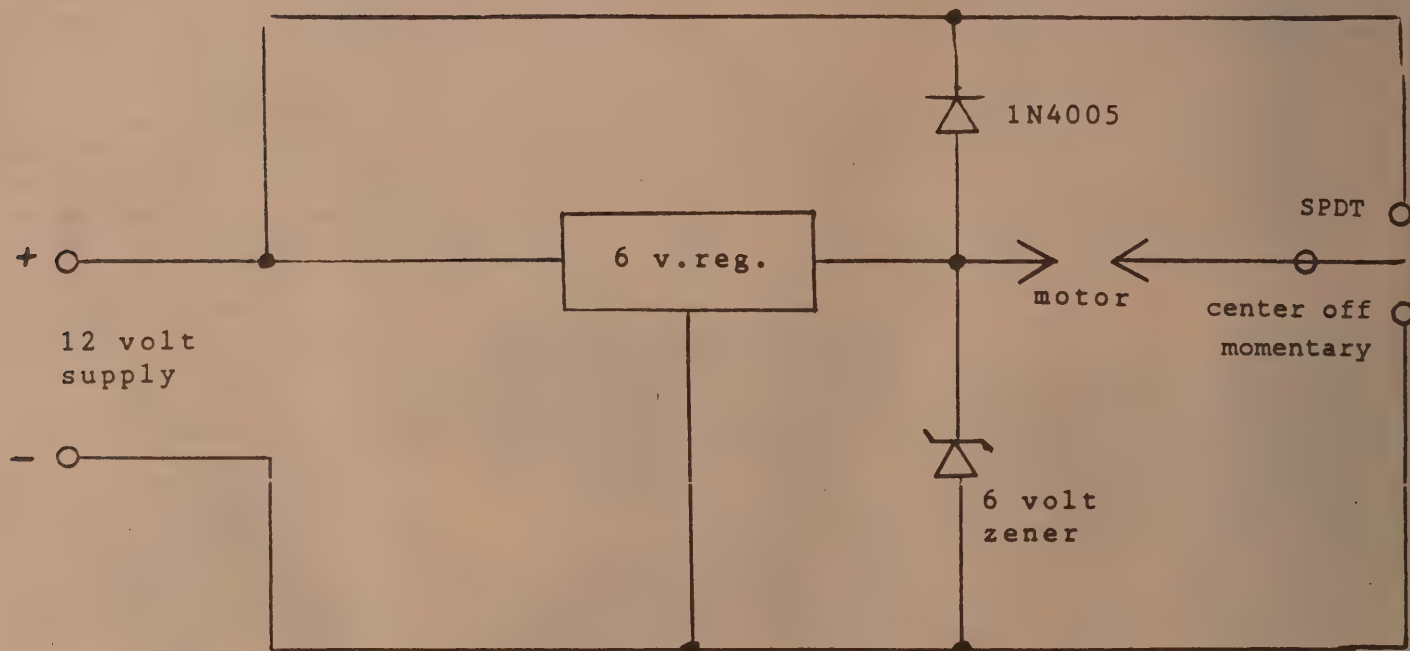
Simple direction control using minimum contacts (relays or switched) with a single ended supply.

Motor voltage can be 6, 12, or even 24 volts. I have successfully built a pan and tilt using this circuit with 12 volts

from a car battery and surplus 24 volt gear motors I achieved slow and smooth pan and tilt action. The 6 volt regulator and zener's current must exceed motor requirements.

Motor common is referenced to the 6 volt regulators output. When the switched side of the motor is connected to the 12 volt supply the zener conducts

protecting the regulator and shunting the current, the motor sees negative 6 volts and runs in reverse. When the switched side of the motor is connected to ground the motor sees positive 6 volts from the regulator and runs forward. The 1N4005 diode is to prevent reverse spikes from getting into the 12 volt source.



# Please Help Find Amy!!

## Amy Sue Pagnac

(NCIC# M375337976)



**CONCERNED CITIZEN,**  
**A Heinous Crime** has been committed! Not only against Amy and her family, but against our society. Law enforcement agencies around all areas have been alerted to Amy's disappearance. **You** can help by relaying any information.

### DESCRIPTION

- Age: 13/Now 16
- Birthdate: 6-15-76
- Light Brown Hair
- Blue Eyes
- 5 Feet
- 100 pounds
- Petite Build
- Pierced ears
- Scar on left cheek, eyelid
- Circular scar on left knee & side of nose

**Missing From Osseo, Minnesota**  
**Since August 5, 1989.**

## STRANGER ABDUCTION!!

If you have seen this child or have any information regarding her abduction, please call any of the following:

**TASC 800-468-3545**  
**Natl. Center for Missing & Exploited Children 1-800-843- 5678**  
**Maple Grove Police Department (Minnesota)**  
**Missing Persons Unit**  
**1-612-420-4000**

**Identifying Information:** Child requires medication for allergies and has experienced seizures due to unknown causes.

**Circumstances:** Child was waiting in her father's car while he went to the rest room at the Osseo Holiday Gas Station. When he returned, the child was gone. There is a possibility that the child may have had a seizure and may have been disoriented.

# STS-55 an Update

The STS-55 Space Shuttle Columbia mission is scheduled to be launched into orbit in late March. The SAREX team is preparing for what should be the first of several SAREX flights planned for 1993.

The STS-55 mission, designated SL-D2 represents the second in a series of dedicated flights for Germany. The primary goals of the mission are to perform studies in materials and life science research. A nine day flight is planned.

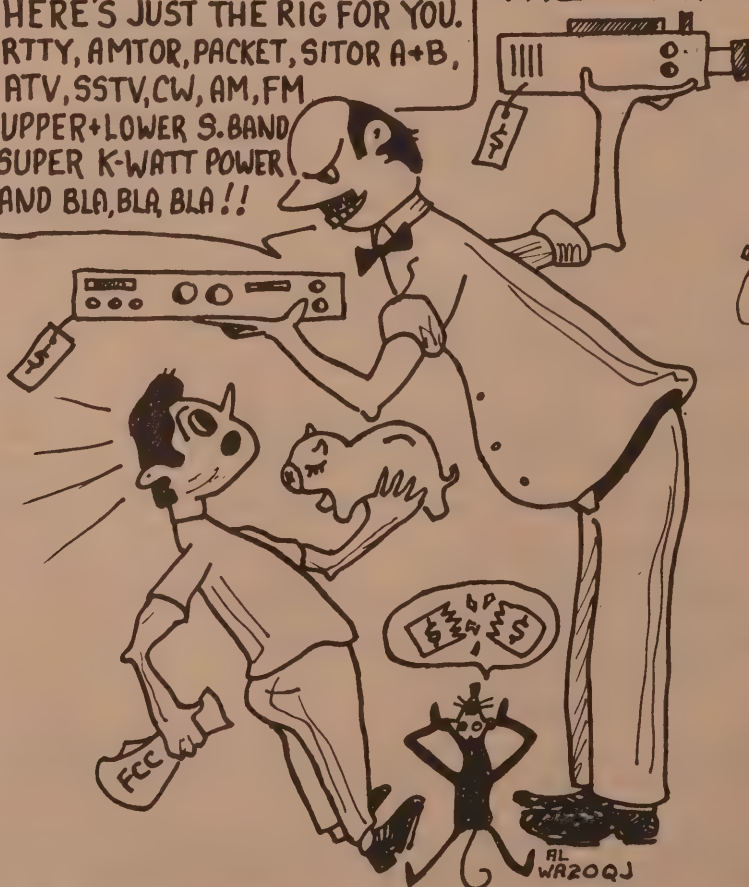
The seven person crew on STS-55 includes ham radio operators Steve Nagel, N5RAW, Jerry Ross, N5SCW, Charlie Precourt, KB5YSQ, Hans Schlegel, DG1KIH and Ulrich Walter, DG1KIM. SAREX operations planned on this flight include 2 meter voice and packet. The primary voice callsign will be N5RAW and the packet callsign is W5RRR-1.

The externally mounted SAFEX an-

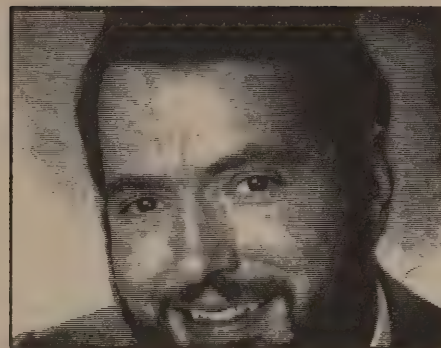
tenna gives the SAREX team an opportunity to compare the performance of the U.S. SAREX window mounted antenna to an externally mounted antenna. A special A/B antenna test is planned on orbits 61 and 62 using the normal SAREX downlink frequency, 145.55 MHz. In orbit 62 the crew will use the SAFEX external antenna. Individuals in the Southeastern U.S. are welcome to help participate in this test by taking signal strength readings of the received signal for both orbit passes.

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# Fast Forward Video



**HDTV update:** In the last two issues of *SCj* I've provided an overview of high definition television, or HDTV, and the process being used to select what ultimately may be America's next generation television transmission standard. As I write this column, it was just announced that the lone analog proponent in the evaluation process—Narrow-MUSE—has been eliminated from further consideration.

It was expected that by the time you read this, at least one of the five original systems being evaluated would have been recommended as the winner. However, of the four remaining HDTV proponents (all of which are digital), none stood out as being superior to the others, and all had some limiting problem or problems to further weaken the viability that one was better than another. Now it looks like the backers of these remaining digital systems may possibly combine to produce what amounts to a single digital HDTV technology with the best attributes of all four schemes. This concept has apparently been endorsed by the FCC as a practical move, and some delay is expected in the standards process. Stay tuned!

**Q - What is video compression?**

**A -** North America's NTSC television broadcast standard requires 6 MHz of RF bandwidth for the transmission of a single analog vestigial sideband TV channel.

This is more than the combined amateur allocations in the entire 160-10 meter HF band! In a digital world, NTSC video requires a data rate of about 100 Mbps, and even with modulation techniques as sophisticated as 64 QAM this digitized NTSC signal still needs a bandwidth greater than that occupied by three analog 6 MHz TV channels. Considering the scarcity of RF spectrum these days, it's clear that something must be done to more efficiently use available spectrum.

In a nutshell, video compression—or more specifically digital video compression—is a general process where a normally wide bandwidth TV signal is squeezed into a much smaller bandwidth. Digital video compression involves digitizing an analog video signal and then reducing the amount of digital information transmitted to fit within standard bandwidths. I've seen demonstrations of 20:1 compression, where 20 digitally compressed NTSC channels occupy just 6 MHz.

As you think about this, it becomes apparent that in order to transmit that much information in so little space, something must be left out or at least compromised. In the case of the 20:1 compression I saw, picture quality can best be summed up as "VCR quality." I would subjectively rate that particular compression ratio as being about equivalent to an older VHS videotape in "long play" mode. Not broadcast quality, but certainly watchable.

More reasonable compression ratios, less than 10:1, but more commonly in the four or six-to-one range, produce pictures that are almost impossible to tell from the uncompressed originals. The four proposed digital HDTV standards each make use of some form of digital video compression to reduce the normally very wide bandwidth of that technology's baseband video information to a much smaller bandwidth suitable for broadcast or cable transmission.

The first commercial application for digital video compression is satellite signal transportation, and already at least two manufacturers are demonstrating working systems. Some satellite programmers in both the domestic and international markets are currently evaluating both vendors' products with on-line tests as this is being written. Within the next couple of years the CATV industry will introduce variations of digital video compression technology designed for fiber optic and coaxial cable signal distribution. Several major cable companies already have signed contracts to purchase special set top converters that also include de-compression decoders, with initial deliveries expected in 1994. This is the technology that will provide hundreds of channels simultaneously on a single cable.

The telephone companies are also working with another form of digital video compression suitable for the transmission of a single TV channel over twisted pair phone lines! One technique, called asymmetrical digital subscriber line (ADSL), supports transmis-

sion of a single "VCR quality" channel with stereo audio, along with simultaneous telephone operation in the home. ADSL sends a compressed 1.5 Mbps picture down the phone lines (it really does work!), although it is distance limited to about three miles or so from a central office. I've seen demonstrations of this technology, too, and while I wouldn't want to watch it on a big screen set, it looks fine on a conventional TV. Other variations of this technology are under development that will transmit near-broadcast quality digitally compressed video (6 Mbps) over phone lines, but limited to much shorter distances.

### Q - How does digital video compression work?

**A -** The accompanying diagram provides a basic visual description of the general compression process (thanks to Scientific-Atlanta for supplying this figure). The first step involves digitizing the analog video, which creates a 100 Mbps uncompressed "data stream." As mentioned before, this requires considerably more than the 6 MHz bandwidth normally occupied by a conventional analog NTSC TV channel, so merely digitizing the video certainly provides no bandwidth efficiencies. If anything, it's quite the opposite.

The general process includes removing picture elements that are unnecessary in the digital domain, such as video sync pulses, since they can easily be reconstructed during de-compression. As well, picture elements that are duplicated from scene to scene, frame to frame, etc. only need to be sent once, and the rest can be eliminated. This further reduces the amount of data to be sent.

Interframe and intraframe processing are the two general techniques used to compress a video signal. Interframe processing takes advantage of similar (and possibly displaced) areas of successive frames, while intraframe processing uses areas within each

picture frame that have similar content.

One type of intraframe processing is known as vector quantization (VQ). In this scenario, the image is broken down into small blocks of pixels, each block, say, eight pixels wide by eight pixels high. Theoretically, each small block can be described by a finite set of combinations of pixels that will produce the same color, intensity, and shading. If a "library" of all the possible combinations (or at least the most commonly used combinations) of pixels in any given block is created, and each potential combination assigned a number, then a number can be transmitted instead of all of the actual pixels in a given block. This further reduces the amount of information that has to be transmitted.

At the receive end, the VQ de-compression decoder has a chip with the same "library" of possible pixel combinations as the encoder. As the numbers corresponding to the blocks of pixels in the image are received, the decoder looks up each number in its "library," and replaces the number with the same combination of pixels that made up the original.

Another compression scheme is known as DCT, or discrete cosine transform. Here blocks of pixels in each frame are converted into transform coefficients that define the spectral content of the block. Redundant information is removed, along with image detail that is not critical to the eye. Huffman coding then may be used to assign variable length codes to the coefficients. Highly used or probable coefficients are assigned short codes, while less commonly used or probable coefficients receive longer codes. This creates a more efficient information flow.

There are many other compression techniques in use, and in many cases an actual process may use combinations of various techniques. The result is a reduction of the amount of data required to reproduce a picture to less than

two percent of the original, with little or no visible picture degradation. Because the transmitted data is substantially less than the original, it's obvious that what remains is extremely critical to the picture reconstruction process. Any data errors during transmission can seriously affect picture quality. Therefore, forward error correction (FEC) is used to detect and correct transmission errors.

Finally, some form of efficient digital modulation is employed to minimize bandwidth requirements. Depending upon the application, this can include schemes such as quadrature phase shift keying (QPSK) or quadrature amplitude modulation (QAM). The result is a very robust signal that looks as good as the original anywhere in the reception area. Picture quality is generally unaffected by multipath or low signal-to-noise ratios (to a point, anyway). Eventually a point is reached where the system "crashes," and no picture can be seen at all. It's generally a case of go or no go, rather than a gradual degradation of quality.

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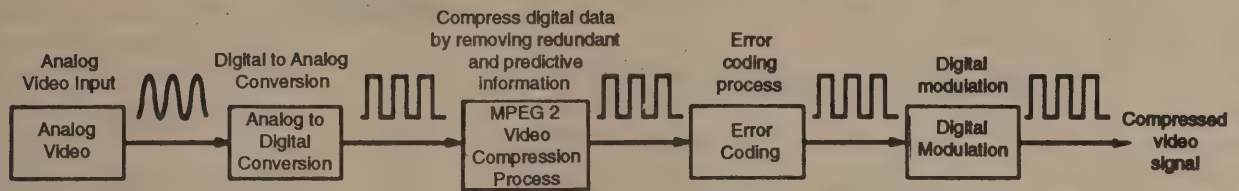
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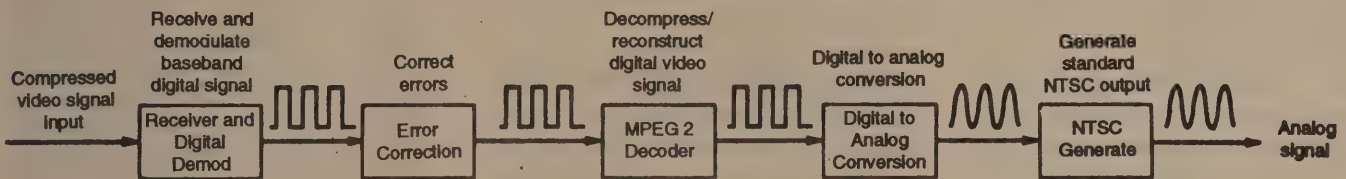
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# Flow Diagram of Video Compression Process

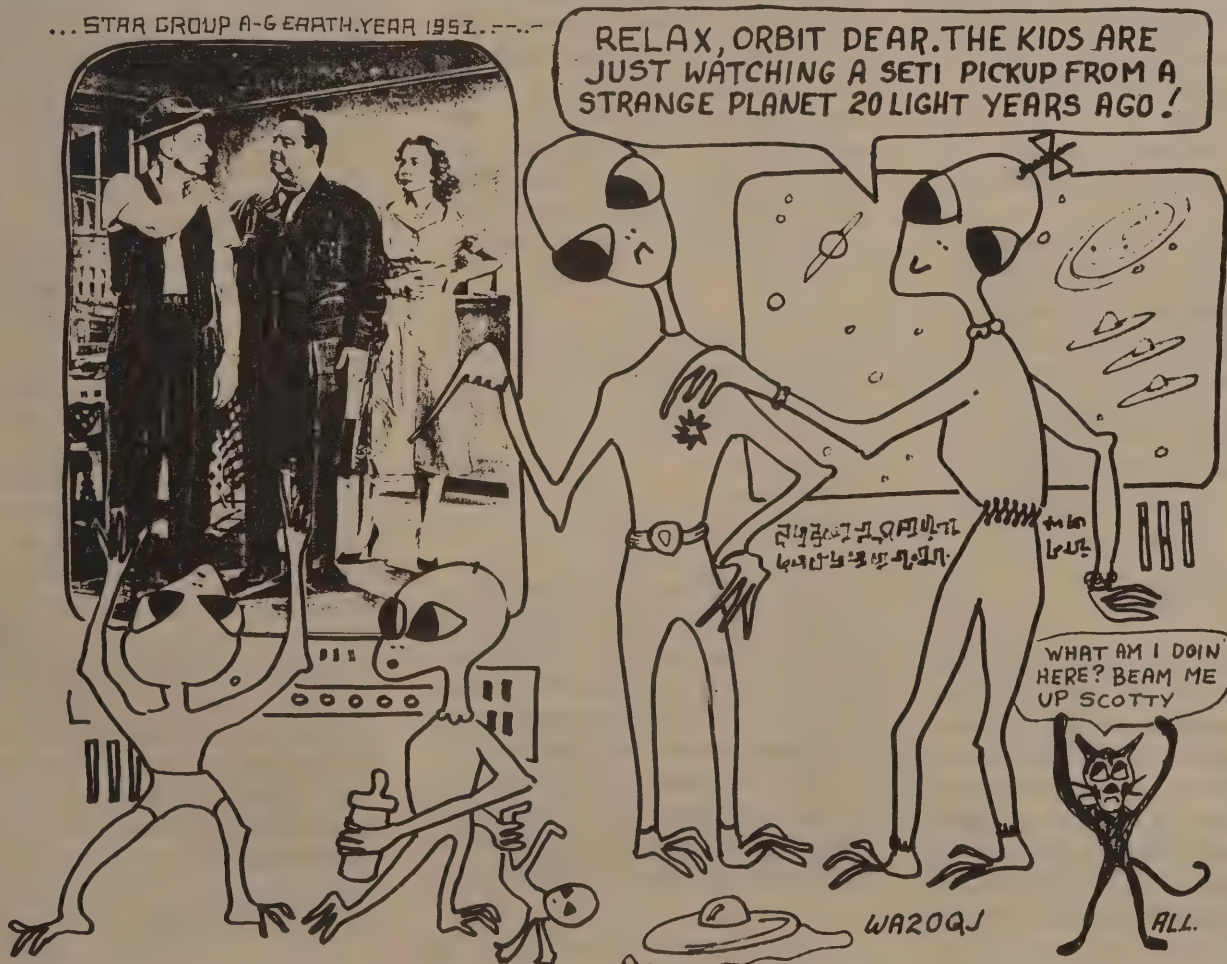


## Compression

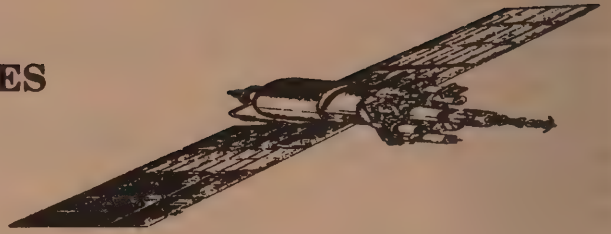


## Decoding Digital Compressed Signals

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## "ON-THE-G.O.E.S" WEFAX SATELLITES



### Getting Started in HRPT

by Tom Glembocki, K04BD  
Editor, WeatherSat Ink

HRPT is becoming increasingly popular as the cost of the reception hardware and host computer continue to fall in price. A few years ago there were hardly any systems available while today the tide has turned - systems are available in all price ranges from the amateur to commercial systems. This series examines all the portions of an HRPT system from an overview of the format used to the schematic diagrams needed to implement a system.

This first installment presents a look at the bits and bytes that make up the data stream. Over the course of the next few months we will be looking at all aspects of assembling an HRPT station - from the basics of the format to building your own plug in PC card, building the antenna, a tracking controller and anything else it takes to build a \$100,000 HRPT station on a beer budget of a few hundred dollars (depending on how resourceful you are).

### What is HRPT?

To begin with, an explanation is in order. Amateurs have for years been receiving the APT and WEFAX images from the Polar and Geosynchronous satellites. These are all low resolution analog images, derived from a higher resolution digital imaging instrument. Now, if we could tap that digital source directly, we would get superior images

at the original resolution the satellite sees - about 1 square kilometer of earth surface for every pixel on the screen. Small streams and rivers that normally don't show in a WEFAX image will start becoming prominent. Ground cover of snow or fog will be evident in digital images. Noise doesn't exist - with a digital image you either receive it or you don't, no in between here. HRPT stands for High Resolution Picture Transmission and is the digital image coming from the 4 US Polar satellites (the Soviet satellites don't have HRPT, but the Chinese do. Unfortunately at present the Chinese satellite is silent due to a computer malfunction).

Basically, there are five areas to consider for amateur HRPT:

- 1) Antenna system,
- 2) Pre-Amp,
- 3) Receiver,
- 4) Data card,
- 5) Software.

This series of articles will attempt to cover the basics needed in each of those areas. WeatherSat Ink, published quarterly for \$15 US funds, 4821 Jessie Drive, Apex, NC 27502 is a good source for keeping up with satellite status and the latest in hardware and software for weather imaging. If you're interested in weather satellites, run for your checkbook and subscribe now! You won't be sorry.

### HRPT Format

The HRPT data stream is a very simple digital data stream originating in the Advanced Very High Resolution Radiometer (AVHRR). The AVHRR is a scanning radiometer sensitive in the visible, near infrared and infrared regions. The AVHRR contains a scanning mirror rotating at 360 revolutions per minute. This rotating mirror scans the earth surface below the spacecraft and reflects the image from below into an eight inch diameter telescope. The size of the elliptically shaped scanning mirror, 8.25 in. x 11.6 in., is adequate to fill the field of view of the telescope diameter. The telescope output with secondary optics is split into discrete spectral bands which are focused onto an array of sensors sensitive to infrared and visible light. The visible and near infrared channels use silicon detectors, while the IR channels use detectors made of various compound metals cooled to 105 degrees K. Radiation falling on any of these detectors causes a proportional current flow which is amplified and Analog to Digital converted into values ranging from 0 to 1023. These digital values are then multiplexed in real time to form the HRPT data stream. Digital values from 0 to 1023 of course mean that the basic data word is 10 bits long. Unfortunately we can't display that many colors on today's garden variety computers (IBM or compatible PC). Today's computer displays (we're talking SuperVGA here - 1024 x 768 x 256) can only display 256 colors per pixel, which means that for black and white pixels where the RED value = the GREEN value = the BLUE value, we can only get 6 bits of gray scale out of an 8 bit pixel, thus limiting our display to 64

shades of gray. It's too bad we have to do that to data which originates at 1024 gray shades per pixel! It is important to note that these sensors are not actually measuring earth land, cloud and water temperature but are in fact responding to infrared radiation being given off by these earth features. The result is an approximation of the actual temperature, and in most cases the approximation is close enough to actual surface or water temperatures to use as a relative indication of the actual temperature. The range of visible and infrared radiation that these sensors respond to is given in the following table:

Channel 1	.58 - .68 um
Channel 2	.725 - 1.1 um
Channel 3	3.55 - 3.93 um
Channel 4	10.3 - 11.3 um
Channel 5	11.5 - 12.5 um

Directly under the satellite the resolution from the AVHRR is 1.1 km per sample. From side to side at the edges of the scan line, the image degrades to 4 km per pixel. The APT data, as well as the HRPT, is taken from the AVHRR instrument. To get APT, the onboard processor selects every third line of the 6 lines per second HRPT data, thus giving us the familiar APT data rate of 2 lines per second or 120 lines per minute. In addition, for APT, the pixels must be averaged to reduce the resolution from 1.1 km per sample to 4 km per sample.

## Data format

HRPT data is easy to decode because the detector samples are simply placed one after the other in the data stream with no additional manipulation. The data order is:

Sample 1 Channel 1, Sample 1 Channel 2, Sample 1 Channel 3, Sample 1 Channel 4, Sample 1 Channel 5, Sample 2 Channel 1, Sample 2 Channel 2, .....etc.

HRPT data has a line rate of 6 lines per second. The 1/6 second HRPT data line is shown graphically in the following Figure.

Each line of HRPT data contains 11,090 words of which each word is 10 bits long and is sent bit 1 first, which is the Most Significant Bit (MSB). The image data actually begins at word 751 and completes with word 10,990, which means that 5 channels of data allows 2,048 pixels per channel per line. Modulation

The HRPT data is phase modulated onto the RF using split phase modulation with a modulation index or swing of  $\pm 67$  degrees. In the split phase format, a data 1 is defined as being positive during the first half of the bit period and negative during the second half of the bit period. The split phase data 0 is defined as being negative during the first half of the bit period and positive during the second half of the bit period. With this modulation, there is always a transition in the middle of a bit period, but there may or may not be one at the end of a period. This can lead to ambiguity in the data recovery if your phase demodulator locks up half a step or 90 degrees out of synch.

## Frame Format

The following table illustrates the format that the channels of image occupy in the frame. The data from the five sensors are time multiplexed as indicated. MSB is transmitted first.

Function	Number of words	Word Code
Frame Sync	6	1010000100 0101101111 1101011100
0110011101	1000001111	0010010101 —
744 —		Telemetry —
Data	10240	Earth —
2 Sample 1	Channel 1 Sample 1	Channel
4 Sample 1	Channel 3 Sample 1	Channel
1 Sample 2	Channel 5 Sample 1	Channel
3 Sample 2	Channel 2 Sample 2	Channel
5 Sample 2	Channel 4 Sample 2	Channel
1 Sample 2048	..... Channel 5 Sample 2047	Channel
3 Sample 2048	Channel 2 Sample 2048	Channel
5 Sample 2048	Channel 4 Sample 2048	Channel
— Auxiliary Sync	100 —	—

*Tom Glembocki has a BS degree in Electrical Engineering and works for the Network Systems Division of a large computer company developing Networking hardware components for Local Area Networks. With over twenty five years experience in digital and analog hardware design, he has developed the logic for the first generation of Space Shuttle computers, as well as the onboard avionics and control systems for many Military and Scientific payloads. As Editor of WeatherSat Ink, he has the opportunity to share some of his knowledge and also to encourage the amateur community to share their knowledge of environmental imaging.*

A quarterly publication for hardware, software and applications of WEFAX, APT, VAS, HRPT and GOESTAP.

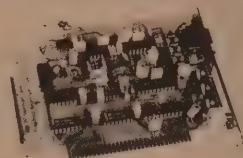
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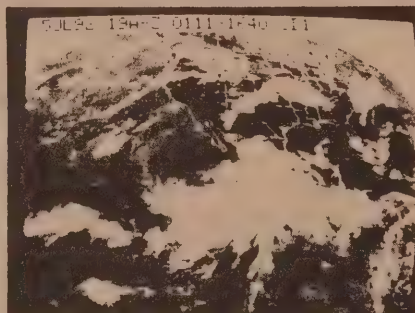
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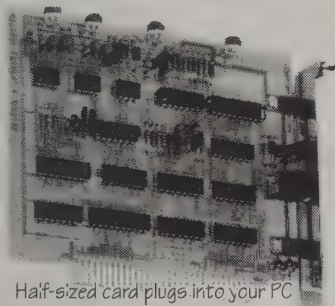
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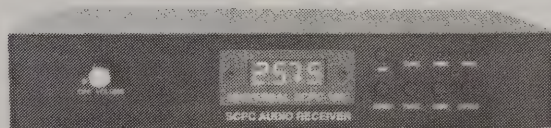
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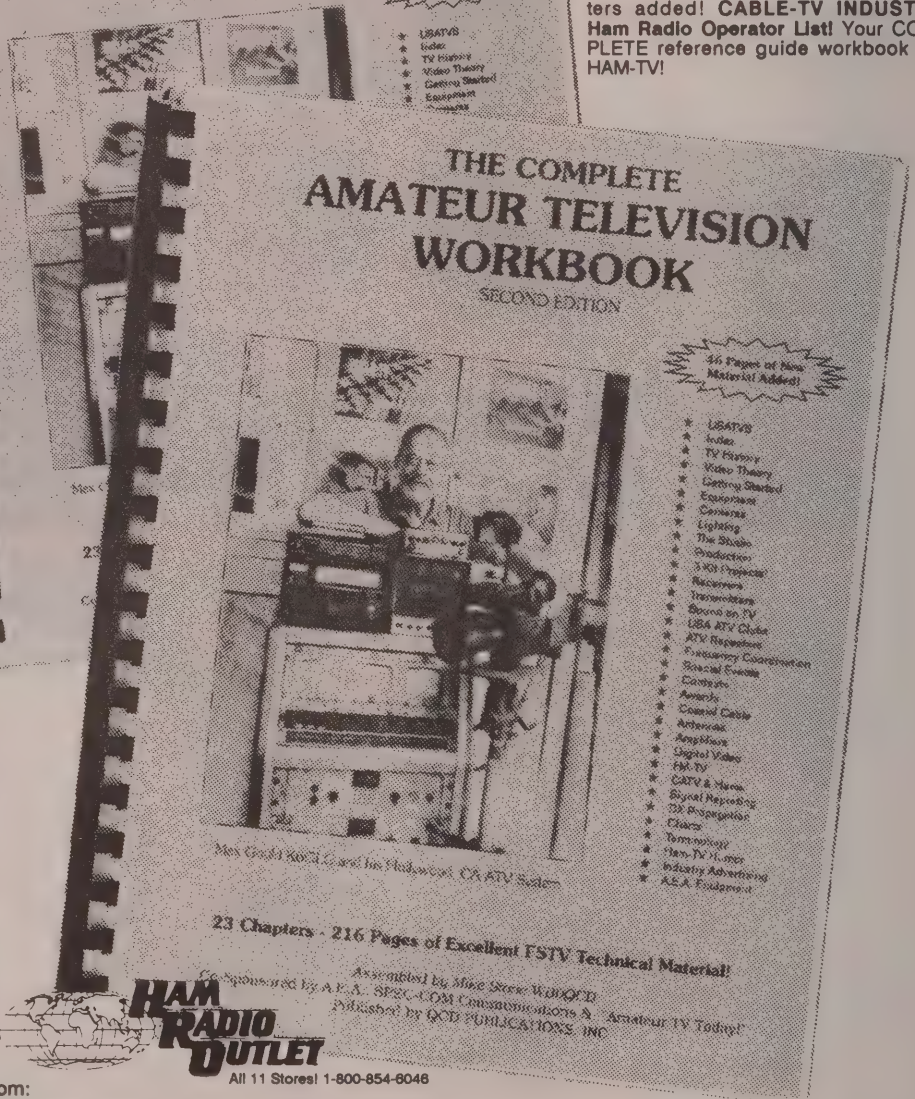
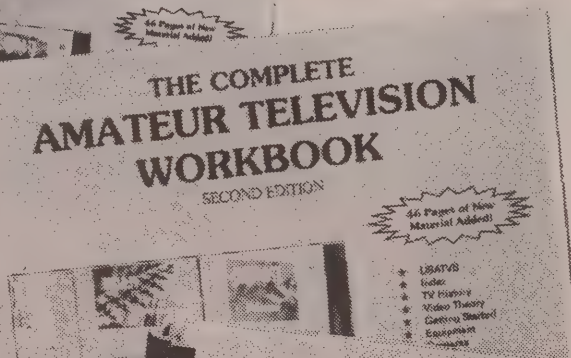
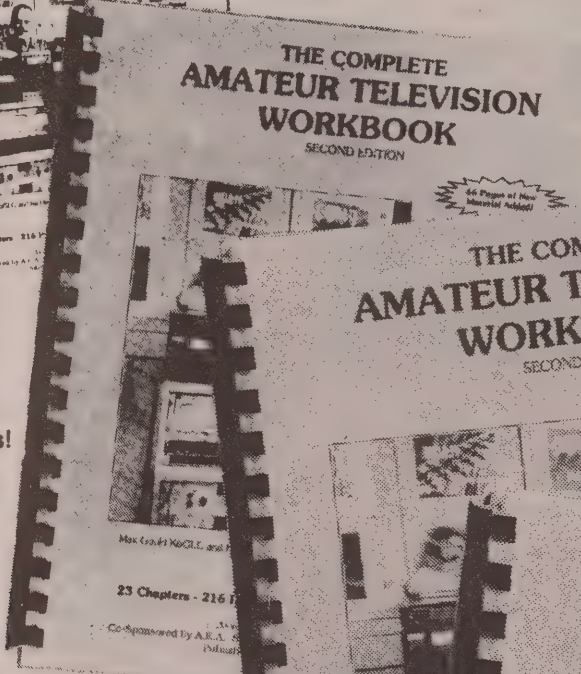
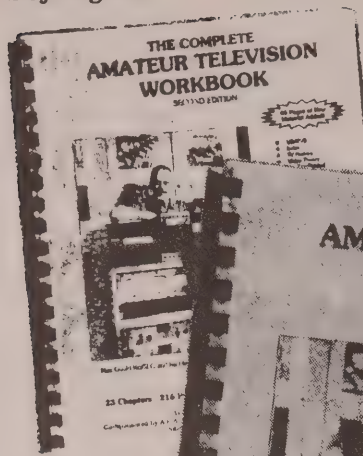
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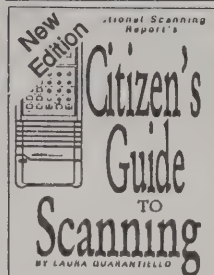
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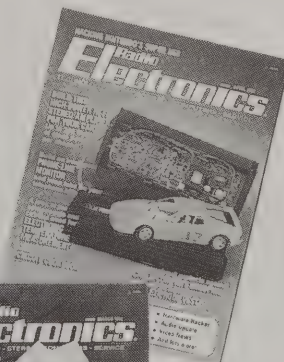
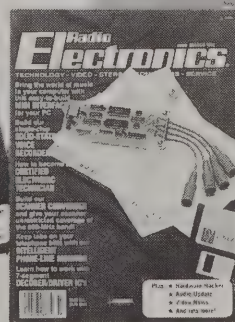
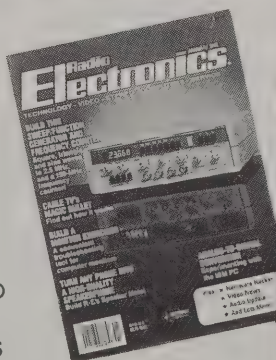
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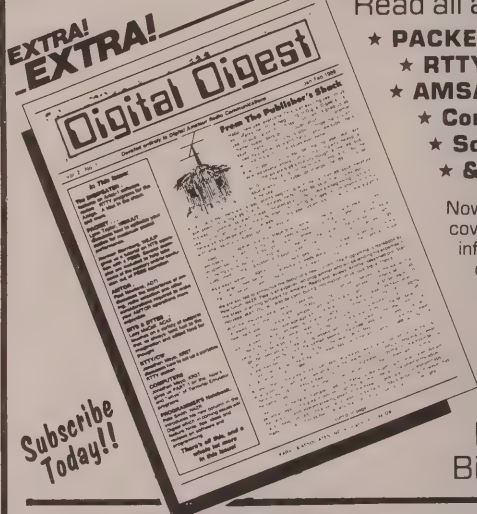
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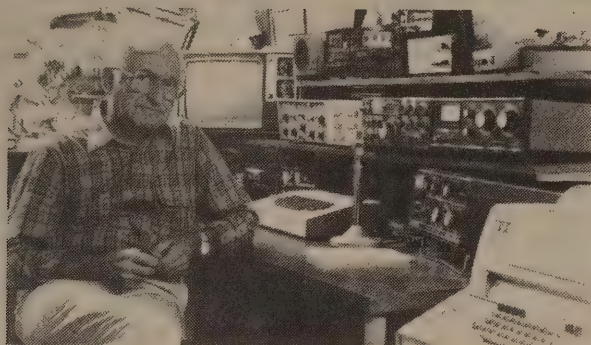


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# "DIGITAL FRAMESTORE"

## FACSIMILE and SLOW-SCAN TV Column



Written by Fred Sharp W8ASF

4676 Hamlets Grove Drive, Sarasota, Fl. 34234

Well, I hope you enjoyed my "most wordy ever" column last issue. There happened to be a lot of new material to cover. My pictures from Meteosat 3 are breathtaking. The signal strength is much better than the failing GOES 6 and I am benefitted by my location in Florida as I have almost a clear shot to Meteo 3. I might mention that my 1.5 meter dish is located on the ground and to sight the azimuth and elevation of Meteo 3 requires that my dish must "look" right through my house! This is something I was told couldn't be done because of the 1.6 GHZ microwave transmission frequency. I really don't know the exact amount of signal loss, but you sure can't tell there is any at all. Pictures are crisp. Actually I have disproven many theories. My dish "sees" through my house, my 137 MHz quadrifilar helix antenna is hidden from it's view of the sky by being located in a stand of live oak trees and my tri-band trap vertical is standing 7 inches parallel to a pine tree and my SWR is 1.1:1 on 10-15 and 20 meters!

### COMPUTERS....AGAIN

My computer situation has changed again. I finally broke down and got a 3-1/2 and 5-1/4 inch high density drive combo. Both drives are in a single half height mounting. I never realized the convenience of putting seven 200 KB satellite pictures on a single disk. I can also put at least that many SSTV pictures on one disk. I'm sort of going

against my own advice by retaining the 8088-1 (V20-1) based machine, but it's a "good ole hoss" and hard to part with and really does all that I want it to do. One really doesn't know where to jump in and invest in a 486. I wager that in less than one year from now, you'll be able to buy a 486DX-33, over 100 MBHD, 4 M RAM, 256 K cache, 2 floppy drives, SVGA with monitor for under \$800.00! I understand Intel has even bypassed the 586 and is going to the 686! See what I mean. Right now, I'm writing this on my word processor (PC-Write) and computer speed means nothing. What I need now is more "finger speed" My hunt-and-peck is the thing that's outmoded! For that very reason, I just sold my perfectly good AEA PK-232, the sale of which serves a few different purposes. Now, I won't ever be asked to write a column on AMTOR, RTTY or PACKET and I never need to worry about my typing speed. If you're a slow typist, did you ever notice how fast the buffer runs out and you're back to:

H A N \_ D L E \_ H R \_ I S \_ F R \_ E \_ D .

Panic always sets in with me then and I get slower and slower. A few years ago when the massive Armenian earthquake happened, being as how I had a large home and a PK-232, I was selected to house and teach AMTOR to a couple of hams who were sent to the then Soviet Union to setup AMTOR communications from Russia to the

rest of the world, broadcasting the names of the dead and near dead to a station set up at the Veterans Hospital in Cleveland, Ohio. At that time, the focal point of my station was the PK-232. Things changed after that and WEFAX/Polar orbiters along with SSTV took over the main interest. Something had to be done to rearrange operating priorities, so the PK-232 had to go. I enjoyed my time with it and always felt I had the best piece of digital mode equipment made, but even a Rolls-Royce can't be admired if it stays in the garage. I had some extra 2 meter gear that fell into disuse because of duplication of equipment (who needs 4 two-meter transceivers). This made more room in the operating console.

### AN UP-TO-DATE ALL THE SATELLITE WATCHERS NEED

My thanks to Datalink BBS for this run down:

NOAA POLAR ORBITING SATELLITES	FREQUENCY MHZ
NOAA 9	Inactive
.....	137.620
NOAA 10 Operating with normal APT VIS/IR	137.500
NOAA 11 Operating with normal APT VIS/IR	137.620
NOAA 12 Operating with normal APT VIS/IR	137.500

### METEOR SERIES SPACECRAFT

The following are inactive at the present time:

2-17	2-20	2-18	3-
2-19	3-5		
Meteor 3-3 Operating with APT VIS/IR	137.850		
Meteor 3-4 Operating with APT VIS (IR Imaging Problems)...	137.300		

### OKEAN SERIES SPACECRAFT

OKEAN 1, 2 and 3 are all inactive.  
KOSMOS SERIES SPACECRAFT  
KOSMOS 1602 and 1809 are inactive  
CHINESE

FENGYUN 1-2 is inactive in APT mode  
It's really hard to predict just what the schedule of operating, if any, the Me-

teor and Kosmos series have. In the past, they changed frequency. You'd be looking at Meteor 2-17 on 137.850 MHz and a few days later Meteor 2-17 was on 137.3. I am frankly surprised that any Russian satellites are operating as I would assume that satellites are not high priority now. After all, Russia can use Meteosat Geostationary and all the American Polar orbiters if needs be.

### LIKE SCIENCE FICTION

Inasmuch as this column has always reported on some weather satellite activity I would be remiss in not mentioning a few new developments in the satellite realm, that appear almost as science fiction. The first one being American and the second Russian. Try these on for BUCK ROGERS (Remember him?) scenarios: The United States effort to drag a miles long wire attached to the space shuttle through space and in doing so, effectively cutting the Earth's magnetic lines of force and thereby generating an electric current in the wire. While radical in thinking, the thing actually did work. The wire refused to unfurl it's full length and only produced a minor current.

I'm going to have to claim prior work on this project because some 35 years ago I did the "Dr. Frank Witcher" spoof on an all night radio talk show in Cleveland with host Alan Douglas when the fictional Dr. Witcher of the "Lake Erie America Co" took his entourage of 180 men to Birkener Island in the Weddell Sea at the South Pole, sunk a 90 foot diameter soft iron rod through the ice shelf (118 miles thick!) 2-1/2 miles down! Imagine a 90 foot rod, almost 3 miles long. The end of the rod (the part sticking out of the ice) was wound with 71000 turns of 300,000 circular mil wire. Sound familiar, sort of the single pole of a generator. The varying flux density of the Earth's field travelled the iron rod and cut the turns of the coil at it's end, producing a current in the coil. It's called the old, "Plunge the magnet in the coil caper", or in this case using the Earth's magnetic field as the flux source. After awhile, we opened the

telephone lines and callers asked, "If you use up some of the Earth's magnetic field, would this cause the Earth to maybe slow down?", to which Dr. Witcher (your columnist) replied, "NOT MUCH". Another caller said if we are generating power like this and want to furnish it to the world free, should he sell his Consolidated Edison stock! Well, it was all a spoof, but you can surely see, I had the "OLE MAKE THE JUICE FROM THE EARTH'S MAGNETIC FIELD" idea first!

The Russian development, which is documented in the Herald Tribune, is their launching on last February 4th, a giant mirror from an unmanned space ship in pursuit of the futuristic idea of lighting up entire cities at night with the reflected rays of the sun. They hope to bounce the sun's rays of an 82 foot mirror toward the nighttime side of Earth. It's a parachute shaped aluminum coated reflector launched from the supply tanker PROGRESS orbiting next to the space station MIR. Sounds like another Dr. Frank Witcher project!!

### THE CHANGING SCENE OF SLOW SCAN TELEVISION

Yes, it really is changing. Certainly there are a lot of Robot 1200's out there but as I mentioned in the last few columns, computer SSTV is HERE. In two hours of listening on 14230 the other day, I logged 18 stations, 11 of which were computer SSTV. That's about 61%...and that's a lot! I have mentioned the various brands before and there are 5 major ones. I will be doing a "hands-on" review of PASOKON TV shortly. I just their hardware interface and software and hope to write about it in the next column. As far as I can determine on-the-air, PASOKON seems to be running in the lead with most users. The major fault with AEA AVT is that you have to buy an Amiga computer to use it. OK, OK, OK, the Amiga has 6 billion colors but most hams already have IBM PC clones. I think Amiga should look to their laurels and get on-the-ball with an IBM AVT system or they will not even be in

the running. Even the "Society for the preservation of Gadgets"...MFJ..... is running in front of AEA now, although most users find a lot to complain about and a lot are thinking of trying something else. You've got to hand it to Dr. Martin F. Joue (MFJ) though, he's constantly on top of the market. Hams are gadget buyers. Dr. Joue is a brilliant marketing expert. Now that I have managed to blaspheme everyone, I suppose I should go-for-broke and have my say about what I'm seeing on SSTV these days. A lot of it is the usual Mickey Mouse, some talented compositions, some pictures of operators, their kids, homes and pets, which I believe is the best subject, but more and more I'm seeing the dirty-old-men on the scene, with nude nude nudes and even a porno shot here and there. A word of warning.....The FCC can frown pretty hard. Those of us who value our ham tickets are the ones in jeopardy. Some will say, well what about the PLAYBOY channel, etc. Bear in mind, those are commercial TV channels who BUY their airtime. Also bear in mind, if you will but remember, Hams have always had to fight for anything they want. I've been a ham since 1946 and I can't remember any time in that 47 years where the hams didn't have to "go to war" for everything they wanted.

### MAIL CALL

Being a Jazz Guitar Player, writing a couple columns and being a Ham doesn't leave loads of time to answer mail, and in any case, my answers to questions may interest other readers as well, so I have decided to answer some right here. At the risk of sounding like Rush Limburger, all my back columns are available from Ralph Wilson of ESF Copy Services, 4011 Clearview Drive, Cedar Falls, IA 50613. You can call (319) 266-7040 or circle a Spec-Com readers service card.

Another reader asked about the worth of owning a Robot 400. This scan converter will become a better and better buy. Last I heard they were selling for around \$150 if you could find one. While the computer based soft-

ware SSTV is very reasonable, a "400" puts you right on SSTV immediately and has the ability to snatch live pictures into memory for transmission, something that the computer systems do not have as part of their interface scheme. News on the Japanese board has been nil and it is not a viable competitor at this time. At least I hear nothing about it.

A reader asked if a "scanner" could be used as a receiver. Any scanner that can tune 14,230 MHZ can be used. For that matter, they can be used for receiving Polar Orbiters on the 137 MHZ band also. Some people associate all scanners with Police, Fire and emergency services only. No need to run out and buy and expensive communications receiver. The question of bandwidth in a tuner will be addressed here and has been addressed in numerous articles. Satellite picture definition will be lost if the bandwidth of a radio is too narrow. A bandwidth of from 30 to 60 KHZ is desirable. Most scanners have bandwidths in this neighborhood.

#### NEW SSTV SOFTWARE

It is my understanding that N9AMR has a new version 1.8 of his HIRES graphics program. I had hoped to do a review this issue but have not heard from him.

Also, while I'm "hoping", I have received new software and hardware from John Langner, the writer of PASOKON, which is now the most popular computer generated SSTV on the air today. I just haven't gotten the stuff installed as yet and make public apologies to John for not being able to review this issue. John has been so very cooperative, I'm embarrassed but I'll make it up to him next time around. His system is absolutely great and is worthy of a long and complete review. While apologies are being "passed around", I might as well toss one in to Elmer and David Schwitek and their able associates, Paul Smith, Steve Warley and Etienne Olivier (the young man who started with the Commodore 64.) They have a new MultiFAX

Weather Satellite and FAX software and hardware receiving system, well documented, that I also have, and my work it cut out for me. As in some of the better, newer systems, it also features gridding and temperature reading of Satellite pictures. A review is coming on this too.

#### LEAVE 'EM LAUGHING

You know what they call a boomerang that doesn't come back?.....

#### MORE FROM SOFTWARE SYSTEMS CONSULTING

The new PC Slowscan Television PC TV 5.1 is just coming out and includes some major improvements. The most important is the ability to display a picture line for line as it is being received. Having just received the software and not having the time to try it, I will give a detailed report next issue. In the meantime I have just gotten some data on the new SSC "Frame Grabber". I haven't had a chance to work with this one as yet, but can say that the price, \$199 shouldnt scare anyone off, because there is lots of SSTV software out there with NO MEANS of saving to memory and the transmitting LIVE pictures. This will be a most interesting item for SSTVers and should help put Software Systems Consulting's name in lights. Review next issue, hopefully.

#### A STICK!

73 and thanks for your many comments and letters.

Fred Sharp W8ASF

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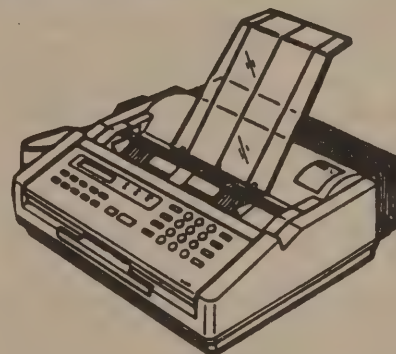
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# OSCAR 13 & SSTV

*We thank Dave Guimont, Jr. WB6LLO of San Diego for this interesting article on Slow Scan activity on Oscar 13. The specialty modes provide great opportunity for experimentation and fun for both active amateur operators and monitors alike. With the abundance of computerized SSTV systems available slow scan is becoming very active. I personally find this combination of operating modes extremely interesting and I am sure you will too. If you have questions or are interested in more information on this operation Dave will be happy to answer any questions you may have. If you correspond by mail please include a sase for Dave and all our article authors. Dave tells me he will furnish us with items of general interest on a "when occurring basis" and we really look forward to more information from him. Dave also reports he has just worked stations in Bagdad and Morocco on the satellite!*

**SSTV On Amateur Radio Satellites**  
Encouraged by N5BF, Courtney Duncan, SSTV experiments began on Oscar 13 early in 1991 following successful SSTV operation with the space shuttle.

He was the AMSAT Operations Officer and the AMSAT Operations Net manager at the time and the plans were laid for early experiments. Sporadic SSTV activity had taken place on Oscar 13, but this is the first known activity to attempt to document results. The effects of doppler, polarity changes, antenna pointing angles and signal strength variations were yet to be explored.

Scheduling proved to be one of the problems. Those of you familiar with satellite operation and have attempted schedules there know that one can

keep about a third of the world happy with whatever sked is decided upon! The second consideration is doppler. Oscar 13 is in a high elliptical orbit. The doppler is maximum at perigee, minimum at apogee. Though the transmission distance is reduced at perigee the use of omni directional antennas results in reduced signal strengths. Transmission times over 36 seconds required a frequency adjustment, and subsequent loss of picture quality.

Antenna pointing angles are a result of adjusting the spacecraft's attitude to provide maximum solar illumination for the panels commensurate with optimum antenna orientation. This operation is ably performed by the team of G3RUH, DB2OS, and VK5AGR. This information related to Mean Anomaly (position of the satellite in its orbit) is published well in advance by G3RUH. Experienced satellite users can easily determine and predict with certainty worldwide picture transmission potentials.

An SSTV net is now scheduled every Saturday and Sunday UTC on mode J and mode B following J. These schedules are on a "not to interfere" basis with ZRO testing and the AMSAT Operations nets. Briefly ZRO is a test of a stations receiving capabilities. The transmitting stations operate on both mode B and J. Short cw transmissions are reduced in power to 24db below the beacon level in steps of 3db. It is an excellent chance to determine your stations receive efficiency. You "can't work 'em if you can't hear 'em", and that certainly applies with the inherent weak signal operations on the satellites.

Net times and frequencies are published weekly in the AMSAT NEWSLETTER. Presently mode J is

downlinking at 435.980 and mode B at 145.960.

Operation is simplicity in itself. Audio lines are connected depending on the particular mode. You are monitoring your own downlink and assuming similar receiving conditions at the other station can quite accurately predict picture potential. Under good conditions it is very easy to tape record your own transmission, and replay it to your own equipment with very little loss in picture quality. The fact that the signal has traveled about 50,000 miles round trip and being relayed by just a few watts of power at the satellite end becomes a fun thing to do.

Because of doppler the receiver frequency needs constant attention.

The accepted satellite procedure is for the sending station to say a few words on ssb just prior to picture transmission. This enables the receiving station to tune accurately, and not subsequent adjustment is generally required. Picture quality is directly dependent on signal strength and signal to noise ratio. Nothing new here, but all prudent satellite users keep their downlink signal at beacon level. The slightest co-channel splatter deteriorates quality.

Several hundred users worldwide have expressed an interest in slow scan on the satellites. In the authors experience fifty or so of those stations have engaged in picture exchanges.

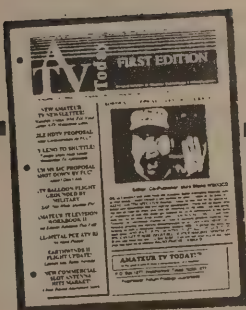
The space shuttle STS-50 had Robot slow scan equipment on board and many pictures were exchanged with ground stations. The crew on STS-50 set a record in space. The San Diego Union reported that fact in the morn-

ing paper and WB6LLO relayed a picture of that article in what was probably the first newspaper delivery in space! All sstver's do the instant QSL routine, and that was also accomplished with STS-50.

If you are not satellite equipped, perhaps there is a satellite operator in your area with whom you could combine operations. **THE SATELLITE EXPERIMENTER'S HANDBOOK** available from ARRL is must reading for all satellite operators. AMSAT headquarters at 850 Sligo Avenue Silver Spring, MD 20910-4704, telephone (301)589-6062 is an information source. Mail them \$30.00 to become a member and help support the amateur satellite program and receive as a bonus six issues of *The AMSAT Journal* and discounts on the software they have available.

I would be glad to help with any questions you may have. If by mail, please include and sase. The phone number is (619) 275-1495 and I'm available for skeds on all bands.

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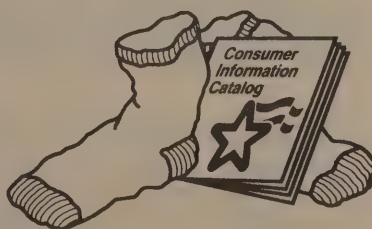
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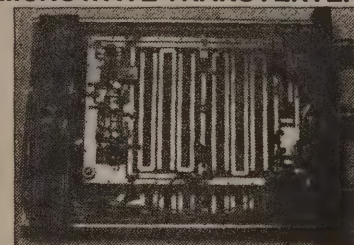
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# Deutsche Welle

By Mike Donovan

Deutsche Welle is the external broadcasting service of Germany. A non for profit public corporation. It is self governing and editorially independent. Its task is to give foreign listeners a picture of German cultural, political, and economic life as well as to explain the German standpoint on major national and international issues. Dieter Weirich is the Director General who has responsibility for programming and administration.

## A Look AT DW

Every day Radio Deutsche Welle brings us an inside look into Europe and Germany. Now, I will give you an inside look into Radio Deutsche Welle. From their broadcast center in Cologne Germany, (one of my favorite cities in the world), Deutsche Welle broadcasts worldwide in 35 languages for a total of approximately 90 hours a day, with about 100 news bulletins. This all adds up to more than 600 hours of programs a week. It has been broadcasting regularly since May 3, 1953, starting with only one 20 KW transmitter and building to the 43 transmitters it utilizes today with a total capacity of 11,550 KW. There are 9 transmitters in both Wertachtal and Julich Germany, 3 transmitters in Konigs, 5 in Nauen and

1 in Leipzig Germany. There are 14 relay stations in Antigua, Kigali, Malta, Sines, and Sri Lanka. Astra 1 A and Eutelsat II-F1 both transmit Deutsche Welle's signals. They are also leasing broadcasting stations in Russia, Brazil, and Canada, The Caribbean and Bulgaria. Since Deutsche Welle has also been producing television programs for more than 25 years. On November 1, 1992 Deutsche Welle TV started transmissions to North and South America, transmitting 14 hours per day via INTELSAT-K and SATCOM C-4.

## Where they call home

Deutsche Welle has their modern broadcasting center in Cologne Germany (or if you prefer Koln Deutschland). Germany, located in central Europe at a fairly high latitude, is bounded on the north by the North Sea, Denmark, and the Baltic Sea; on the east by Poland and Czechoslovakia; on the south by Austria and Switzerland; on the west by France, Luxembourg, Belgium, and

factories produce chemicals, metal wares, textiles and electrical goods. Cologne is also an active port for the agricultural and industrial products of the area. One of the most memorial sights in the city is The Cologne Cathedral, saved from heavy bombings of World War II. It is considered a masterpiece of Gothic architecture and one of the most impressive religious edifices



in Europe. The cathedral is in the shape of a cross and is built of light gray stone. It had its construction started in 1248 and completed in 1880. It is 472 feet long and 201 feet wide. It covers 65,000 square feet. The main walls rise 150 feet high with fantastic detail. The center tower is 357 feet high and the twin front towers are each 512 feet high. The beautiful stained glass windows represent Biblical subjects. While the structure requires almost continual



the Netherlands. Cologne is located in the west central region of Germany on the west banks of the Rhine River. Cologne still has some historical monuments that were preserved from damage during World War II. An important center of West German trade, Cologne's



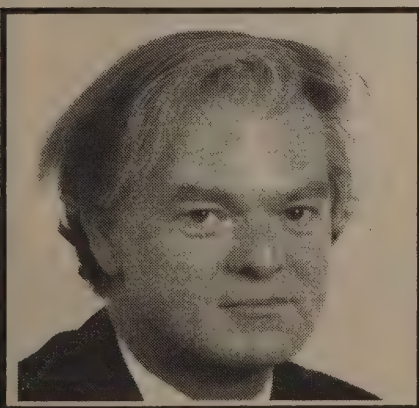
maintaining it is exceptionally impressive and breathtaking. A stroll through the pillar supported interior is a trip back in time where you are in awe of the beauty and detail. I can stand and appreciate the architecture for hours on end. Words fail to describe this



magnificent structure.

## Who's Who

Deutsche Welle employs approximately 1600 people, two-thirds of whom are technical and administrative staff. In 1992 they had an annual budget of 500 million deutschemarks, most of which is provided by the federal parliament. Dieter Weirich has been director general since December of 1989 and they have a 17 member board of governors (Rundfunkrat) and a 7 member administrative board (Verwaltungsrat). Others involved with the operation are program director Josef M. Gerwald, TV directors Siegfried Berndt and Dr. Wolfgang Kruger, Administrative Director Reinhard Hartstein, Technical Director Gunter Roessler, Editor-in-Chief (radio) Dr. Franz-Josef Neuss, Editor-in-Chief (TV) Christoph Lanz



and Head of the English Service Dieter Brauer. As part of its development aid policy, Germany attaches great importance to furthering mass media in the Third World. In addition to the construction and expansion of transmission and studio facilities, basic and advanced training of broadcasting personnel is an important part of this international corporation. Deutsche Welle has run a training center since 1965, which provides preliminary and advanced training for radio staff. To date, more than 2,500 trainees from 106 countries have attended courses.

## English Broadcasts

Deutsche Welle now broadcasts programs in 34 languages around the clock. 98 news bulletins per day transmitted by short wave around the world provide information to listeners in all continents. The programs include reports, comments and features on politics, economics, sports and music. Currently, radiobroadcasts can be heard in English here in North America at 01:00 - 01:50 UTC on 6040, 6085, 6120, 6145, 9515, 9565, 9610, 9700, 9770 and 11865 KHz. At 03:00 UTC on 6045, 6055, 6085, 6120, 9535, 9545, 9640, 9705, 9779 KHz. Or at 05:00 - 05:50 UTC on 5960, 6045, 6120, 6130, 9535, 9670, and 9690 KHz. You can also find them on INTELSAT K338.5 degrees East Transponder H 7 the Polarization is horizontal with international programs 7.20 MHz subcarrier and SATCOM C-4225 degrees East Transponder 5 V the Polarization is vertical with international programs 7.38 MHz.

## The Programs

The programs broadcast in English are extremely interesting and useful to us wanting to learn more and keep in touch with the views, opinions and news of Germany and Europe. The European Journal is a review with interviews, analysis and background of major events in Europe and Germany. With a good blend of topics this program will keep you informed. A variety of musical programs will introduce you to a wide variety of music. The

German by radio language program will let you learn the German language (I have just started my SyberVision German series of audio tapes language training program and will be using the German by radio program to practice what I am learning). Science and Technology is a weekly magazine program presenting new developments in science and technology. "Through German Eyes" is a in depth interview program with prominent German journalists. These and many more great programs are offered in English for your enjoyment and education. A complete program guide can be obtained by writing DW at the address given in this article.

## Listen in

The programming is interesting and informative. The Short Wave signal is strong and the format is impressive. With all this all you have to do is tune in Deutsche Welle and listen. If you have a general coverage receiver you will find the signals dependable. Even with my low cost portable receiver I can listen to DW from all over. I would suggest that enjoyment and information from this fine station is well worth the cost to buy a portable receiver and start listening today!

## Talk Back

Deutsche Welle can be reached at : Deutsche Welle, Post Office Box 10 04 44, 5000 Cologne 1 Germany. You can receive their free monthly program guide "Tune In" or their Deutsche Welle TV guide by writing to them. I hope you enjoy their programs and give them the feedback by mail that they and all short wave broadcasters like to receive.



# FAXCAP

*William Nolle of Hazel Green, Alabama has introduced and Comparator demodulator for wefax and slow scan television capture to you computer. Not only that, it will decode RTTY, CW and other modes. This is a simple but effective way for hams and monitors to get in on the action. When asked about the FAXCAP, William told us:*

"The way it came about is that I saw a need for someone to help those people on the numerous BBS echo's I frequent for a low cost wefax demodulator. There are a lot of people that had problems with obtaining the parts and also the schematic but still had the urge to want to get into this facet of the hobby. So I figured since I love this hobby and am retired and needed something to occupy myself that I would make a few available to the people on the Fido Ham and SWL echo's.

I sat down in front of my 486/33 using Autocad for the artwork and CorelDraw to convert the artwork to a Tif format. Then I used my laser printer to print some prototype board artwork on Tec200 film. In turn this was used to make about a dozen or so Faxcaps. But I soon found that 12 would in no way satisfy the people wanting these units. Therefore I did some leg work and found a pc-board manufacturer locally and had the boards made there. I send several of the completed Faxcaps to friends to Beta test so to speak just to make sure they would work with most available software and computer systems without problems.

Well before to long I started to receive orders from all over the world. It really does me good to be able to help that many people get into this hobby at a reasonable cost.

The Faxcap is handmade by myself

and are all tested on my Icom R71A before I let them go. I also include several programs to get them started. So far I have had not one unit fail and have received many letters about how well the Faxcap performs.

The construction is pretty much a straight forward design using SMD (Surface Mount Device) parts of the highest quality. The Faxcap is build into a metalized DB25 connector that provides 60db of shielding. I did this because many people where having problems with RFI from their PC's. They are of course hand build and assembled by me using a LARGE magnifying glass sitting by my trusty short-wave receiver while i'm working on them."

*When asked if there are other projects on the drawing board, William told us:*

"The demand for a low cost demodulator and the response I have had made me start another project that many people cannot afford to purchase in many cases. I have just now completed testing a computer to radio interface called Compulink that I will make available very soon. It is also build into a metalized DB25 connector just like the Faxcap. The Compulink will work with most all Icom, TenTec and Yeasu radios. It also came about due to many people not being able to afford to pay The high dollar of commercial units. The Compulink also has a squelch control cable that will work to build frequency data bases."

*We asked about the cost of the FAXCAP:*

"At \$29.95 + \$4.00 shipping I do not build these to get rich, but rather to help many people that would otherwise

be unable to get into this part of our hobby."

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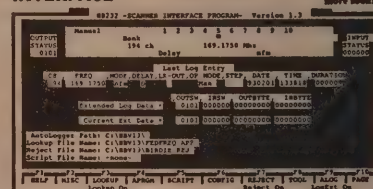
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# FAXCAP

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The FAXCAP is a Wefax Demodulator (Comparator) which when connected to a PC Compatible computer and a general coverage shortwave receiver will capture Weather Fax and Press pictures. With the software included you are also able to receive such things as RTTY, CW and other modes. The FAXCAP is build using the latest SMD technology. The FAXCAP does not require a power supply, it draws a minimum amount of power from your PC's serial port. The FAXCAP is an excessory that your shack should not be without. All you do to get those great weather and press pictures is to plug it into your free serial port on your PC and plug the audio jack into the external speaker jack on your receiver, then tune in one of the many fax frequencies from all over the world and enjoy the pictures. The fax receptions can be saved to disk in the popular Gif format and also printed to a dot matrix or laserjet printer.

There are many units on the market that will receive Wefax, but all are many times the price of the FAXCAP. and few are as compact in design as ours is. All units are handbuild and each one is tested by receiving at least one complete weather fax of either a earth view or marine chart.



For a limited time you can get the FAXCAP complete with HAMCOM2.0 and JVFAX5 software on a 3.5" disk. for .

## \$29.95

Please add \$2.00 for shipping (First class)  
Foreign orders require \$3.50 shipping (Airmail)



RTTY AUTOSTART

At writing time, a vicious storm is ripping apart the New York, Long Island area. My R5 Vertical is hanging in the apple tree and downed power lines are flashing in the night sky, together with crashes of lightning and exploding power transformers. All bridges in and out of the city are closed as are all three major airports. Repeaters are giving priority to mobile stations and the fire department frequencies are in chaos. What started out as torrential rain, is now a blizzard with winds up to 80 mph in gusts at Lagueardia. When you read this we will already be looking forward to spring and this will all be a sad memory (sigh).

Fortune smiled on me this week, and an Epson 286 computer was mine for a ridiculous price. My dream of owning a computer that can be devoted to communications and another that can be utilized solely for word-processing and graphics is finally realized. My order to MFJ for the latest update for the MFJ 1286 and associated software has just arrived and will soon be entered and running.

There are many updates for Packet, RTTY and SSTV. Unfortunately the SSTV will not be of much value as they require the use of a 366 machine or better and even my new one is merely a 286. The new chip (a free update for 1286 buyers) installed easily and the associated software (\$30) upgrade release 3.6/3.6X has just been put on my hard drive. Still no addition of "type ahead" so will have to be happy with my fast typing and buffer storage. Problem is, when a contact is long winded I forget what was said when it has scrolled over the top of the screen. Heard one

fellow say he solved this by stacking monitors but I don't believe it.

Ran across an old RTTY ham, K8LC, Walter of Irontown, Ohio who is an avid RTTY pix operator and still runs a 28 machine. My collection of 800 RTTY pictures on tape is extensive but Walter claims over 2600 and still looking for more. Not only that, but he has also managed to transfer all the pictures to floppy disc and is able to call them up on command. He is using the 28 as a "read-only" source along with a Kleinshmidt reperf. By some means he has tied the computer into the closed loop and converted the paper tape info onto disc. Walt and I have been writing and I hope to convince him to release his method so we can share his expertise. Don't throw that ticker tape out the window at the next parade, there is hope yet.

My DX station of the month is George Borges, CU3AY, and his dad CU3EM, who get a 599 here at my location. His sky hook is a two element cubical quad for 10/15/20. The first home-brew at-



tempt was a fiberglass frame and the strong Azores winds demolished this after 2 years. Next try was iron pipe and although very sturdy, the weight

of the pipe distorted the tower. Since then they have found better ways of bonding the fiberglass tubing and to date it has been weathering the storm



George and the OM take turns at the Kenwood 440s and the Yaesu FT203R that they have on VHF. If you don't remember the location of the Azores, they lie just off Portugal and Spain and are mere dots on the map. George likes his home but wishes there was more land to accommodate the tourists. Listen for George and his dad on their favorite band, 15 meters and receive their very attractive QSL.

Did you ever realize how many short wave listeners are printing your RTTY signals. My last mailing from the QSL Bureau contained six SWL cards and I am not an extensive operator. I usually send my SWL verifications direct to SWL's but at this rate I must learn more about how to send these cards via the bureau. I have been told that this can be done if they have a registered station number? Some countries require that a certain no of SWL verifications be made before a novice can acquire his first ticket, so please don't ignore these mailings. Many of those listening stations have some pretty exotic radio gear and are experts at tuning the whole radio spectrum and not just the tiny little speck that we occupy.

There is lots of interesting stuff out there besides our little chatter. It is somewhat dated that the name of this column be called Autostart when actually very few stations are autostart these days. Some of the latest decoders have an alarm system built in that will read and detect your call and ring a bell.

Other than Amateur radio, many other electronic devices are appearing on the market that activate appliances in the home including a full line by the Heath Zenith. Many of these products work by sending signals via telephone and radio. Security systems can be checked while driving in your car hundreds of miles away and even your TV dinner can be started the moment you leave work. A word of caution is appropriate.

There is an element of danger involved here. Whenever a piece of equipment is started remotely the danger of fire or explosion is possible. Maybe the cat pushed a newspaper to near that electric oven. Could there be a gas leak that even the ringing of a telephone could set off? Make sure that anything you automatically turn on has a built in timer that will also shut the device off. That roast in the oven could also cook the house while you are getting a traffic ticket or while you stopped off to see a friend and just plain forgot. A very good friend of mine had a bad experience with an ASR machine while on autostart and he was in another room. The motor overheated and he had a house full of smoke. Rare, but it can happen with any automatic device. So be careful out there with these robotic type conveniences as under the wrong conditions they can be deadly.

**WANTED:** Someone to fill my mailbox (the regular kind) with stories and pictures about RTTY or any other digital communications. Send pictures, color is OK but black and white reproduces better. I respond personally to all mail and am always looking for your views, comments, stories, pictures and anything that might be of interest to Spec-Com readers. That's it from here.

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# TRUNKED RADIO - CAN YOU LISTEN IN?

## Trunked Radio Systems

Not too long ago a radio system consisted of a base station with a roof top antenna serving several mobiles on a specific frequency or perhaps a variation of this with a remote site transmitter or repeater. Multiple frequencies were used to communicate with different groups or to support separate operations eg: dispatch, operations, tactical etc. Manual switching was required, or a scanning scheme was required to scan the assigned frequencies and then lock in on a specific frequency to transmit on. For example, your local police department may have six frequencies assigned to them. One would be used for dispatch of mobile units, another for tactical communications while on assignment, still another to get and receive license plate information and so on. This system allows the dispatcher to communicate with the mobile units on a priority basis. The main dispatch channel is not tied up with DMV record traffic nor is the in field operation channel interrupted with a traffic stop call. As the system grows so does the complexity of the control system making them complex and sometimes unreliable. By the nature of the system some channels are busy with activity and some are seldom used. While this method does serve the need, frequency utilization is

*As the system grows so does the complexity of the control system making them complex and sometimes unreliable.*

not efficient, the complexity of channel switching can cause confusion, or demand complex systems, co-channel interference is also a problem with many systems. Monitoring of the activity is quite easy for scanner enthusiasts. All that is required is to program each assigned frequency into the scanner, (maybe assign priority scanning to the main frequency), and set your delay to cause the scanner to remain on the active frequency for a time to allow the reply to be heard.

## The Changes

The use of computer controlled trunking systems addressed the problems and provides the users with a reliable system that better utilizes the frequency spectrum. "Smart" programs can provide the user divided into fleets and sub fleets for control and priority, with flexibility, control, and pre-determined operational parameters. A built in security element is inherent with trunking systems as the casual listener will not want to put up with the digital buzz, locking and unlocking frequencies into their scanner, and the manual intervention that is required to track the targeted communications. These communications can be monitored but it takes some understanding and effort. Today's trunked radio systems operate with repeater output in the 851.00 - 869.00 MHz range and input 45.00 Mhz below (standard band plan) at 806.00 - 824.00 MHz. While there may be some "talk around" simplex activity on the input frequencies the repeater output frequencies will be the ones of most interest. There are normally five or more repeaters in a system with separate output frequencies. One of the channels serves as the "site controller" by transmitting continuous digital tones (an unmistakable buzz sound) normally at 9600 baud. This stream of

digital tones tell the radios what repeaters are active and what fleets or sub fleets are active. The logic that is transmitted to the mobile and portable units is programmed by the system operator. This operator may be a specialized mobile radio (SMR) system or a large, single user. The SMR operates the system and sells use of the system to its users who are called fleets. Logic can assign priority to users and most systems have an emergency override provision for its users.

## How it works

When a mobile or portable wants to make a call, the microphone button is pressed, the site controller selects an unused repeater and digitally switches all the radios in the fleet to the selected repeater. The "site controller" uses a digital signal transmitted to first send an ID to the calling mobile or portable. If the data coming from the repeater is the same as the mobile or portable ID code, the mobile knows that it has successfully accessed the system. The system then sends a message to all other units in the fleet or sub fleet telling them to move to the same repeater. This control normally takes about .4 seconds. Every time the mobile or portable keys the microphone button, a new channel is assigned. This allows maximum utilization of available frequencies. There is priority of both fleets and units within each fleet available to assure emergency traffic can get through over routine traffic. The logic of a system can assign emergency override provisions in the event the "site controller" goes down.

## You can listen in

You can monitor the 800 MHz trunked system by programming all the trunked channels in your scanner from your

favorite data base or use the HB232 computer interface with your Radio Shack scanner and Sherlock program (see information in this and last issue of The SCj about these systems). You will quickly find the site control frequencies by it's digital "buzz" noise that ties up your scanner. Lock that frequency out (or those if you have more than one system active in your area). This "site controller" frequency will change on a daily basis or maybe twice. Many systems are programmed to change around midnight. You will have to lock the new control frequency out and put the old (previously locked out) frequencies in daily. Do not use your delay function as when a mobile or portable "unkeys" the microphone button, and a reply is not made by another unit before the carrier drops, the system will switch to another repeater. You don't want your scanner delaying at the old channel as you will miss part of the conversation. When more than one user is on the system at one time you may have to manually press your scan button to find the right repeater to monitor the traffic you are interested in. While this is not ideal, it is a way you can scan the trunked frequencies. While this may all sound a bit confusing and will require a little intervention on your part to track the activity, you can keep up with the action on the trunked radio systems that many communities are switching to.

## What is next?

An expansion of SMR services is being considered. This could include low power systems to allow reuse of frequencies in larger cities and higher power systems to allow wider area regional systems. Telephone interconnections are available on SRM systems as well as digital capability.

## The Real World

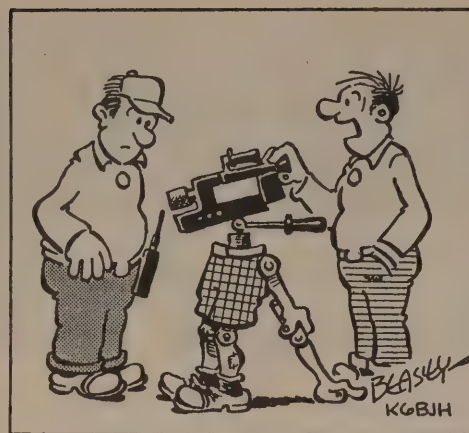
Now, having said all that, let me point out that in the practical world there are variations of every thing. For example, here in my home town scanning the trunked frequencies is quite easy, because there is only a hand full of users that are all business or delivery types.

It is not very interesting, but it is easy. We have two systems with five repeater output frequencies in each. None are using the scanner busting tones that can jam by your scanner. The squelch tails (the time the repeater hangs, waiting for a reply after the sending unit has unkeyed) are generally sufficient to allow the replying unit to respond on the same frequency therefore eliminating the manual pressing of the "scan button". Most of the time the system is not very active, so even if the responding unit is slow at the switch, the scanner will track them as no one else is on at the same time.

*Many variations exist that will effect your results.*

But what about bigger systems? Denver recently switched their police and fire communications to a trunked system with 40 repeater outputs. In the real world, a larger system means more communications, more activity, and more of a challenge for the scanner enthusiasts to track the action. When I scanned the Denver system last week I found not only the site controller digital signals, but a variety of buzz noise, almost musical tones, and system beeps. While with a lot of intervention and key pressing one can track the targeted systems, it surely is not as simple as scanning once was and can be downright frustrating.

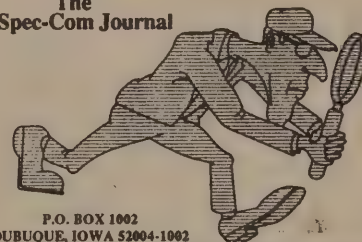
So as you can see, depending on where you are monitoring, many variations exist that will effect your results.



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NO, THERE'S NOTHING WITH THE SWEEP CIRCUIT, THE XYL JUST THREW A BROOM AT ME!

# The Scanner Report

## This Issue

In this issue we have a collection of scanning related issues. Whether you are a dedicated scanner buff or a ham using your scanner for casual listening we hope this section of our magazine will be of use to you. The technology discussion we present applies to many of our interests and we welcome you input for future issues.

## Audio Mod. for Pro-43

I am really enjoying my new little Radio Shack Pro-43 scanner. The small physical size combined with it's large size performance makes this a great handheld for my needs. Finding that I use the scanner in the car or other noisy areas quite a bit, I did find the audio output just a bit difficult to hear at times. My hearing favors a slightly higher pitch of sound than the small speaker was giving. I find the somewhat "bassy" output of the Pro-43 to be difficult to understand, especially mobile or in other locations with noise. I am not alone in this opinion as I have seen a number of FIDO net and BBS messages on the topic make the same complaint.

Bill Cheek of COMMtronics Engineering who publishes The World Scanner Report said "In a word the Pro-43 (Radio Shack Pro-43 handheld scanner) is likely the best yet in the handheld class.", and I agree with him. Bill has offered a modification that offers substantial audio improvement. I have performed the modification as presented by Bill and found it to indeed make a significant improvement in the audio quality of this scanner. I remind you

that modification of any equipment may void the warranty from the manufacturer and could cause damage of the equipment. I only offer this information for your consideration and cannot warrant the modification in any way or be responsible for any damage that may result. I suggest you strongly consider these dangers before making any modification to any equipment. For this or any modification you should obtain the service manual for the equipment to help you with component location. While this modification does improve the quality of the sound, it also tends to bring out the background hiss that may not be to your preference. But, if your preference to sound is for a boost in the treble frequency this modification really helps.

## Why it works

You will be removing a capacitor between the audio input of the audio power amplifier to ground to boost the treble (improve the high frequency response). According to Bill, the reactance, XC, (impedance) of a capacitor to an AC signal is the reciprocal of twice PI times frequency times capacitance. As the frequency increases, XC decreases. C-341 is a 0.015-uF capacitor. At a frequency of 1000 Hz the impedance is 10,616 Ohms, and at a frequency of 2000 Hz the impedance is 5,308 ohms. As you can see the impedance drops by half when the frequency is doubled. This will have the effect of approximately halving the input to the power amplifier everytime the frequency is doubled. Thus, bassy signals will be least attenuated and treble signals will be attenuated. In effect, high frequencies are shunted to ground and not amplified where bass frequencies are

untouched. Removing the capacitor will give the boost in treble frequencies.

## The how to

1. Remove the rear cover of the Pro-43 by removing the end cover and battery pack, remove the four small black screws on back of the plastic case, then squeeze the sides of the plastic case at the battery compartment end while lifting outward. The whole rear case will slide up, straight off the body of the scanner.

2. Desolder the ground tab from the BNC connector to the circuit board. Slip a small screwdriver underneath it first, and exert a very gentle upward pressure as the solder melts. When it is free, bend it straight up and away from the RF board.

3. Desolder the center antenna connection from the RF board. This spot is that bare, stiff wire that sticks straight up from the RF board at a point about 1/4" directly back from the previously desoldered BNC ground lug. This wire goes through a rather large hole which is easy to desolder. A solder sucker, vacuum bulb or solder will be helpful here. Remove the solder from around this wire from the topside of the RF board without damaging the wire or the BNC connector.

4. Remove the two cable/plug combinations. These are the two brown plugs with the multicolored wire bundles. NOTE: These wire bundles are tightly tucked around the metal box on the RF board, so before disconnecting the plugs, lift each wire one at a time, with a thin tipped instrument until all the wires are crossing over the metal box area and are loose. The wire bundles have 2

metal post guides to watch for; don't damage them.

5. Remove the six silver screws. Very gently work up and lift off the middle circuit board and flip it over so you can see the solder side.

You will need to find C-341, though it won't be marked. It's located on the bottom of the RF board between C-340 and R-350. R-350 is marked with a "333". Locate IC-304, the LM-386 power amplifier chip from the top side of the board and identify pin #1 where the dot or indent is. Then identify pin #4. Now flip the board back over and look for pin #4 on the bottom side of the board. The first little black component on the trace that goes to pin #4 is R-350 (do not remove it). Immediately next to R-350 is a little brown, unmarked component which is C-341. Double check component location in your service manual to make sure you have C-341 and not the wrong component. Remove it by carefully desoldering it.

You can now reverse assemble the Pro-43 scanner, resolder the antenna connections, and fire the unit up with the improved audio.

## HB-232 Update

In a computer message, Bill Cheek passes the following information on about the HB-232. The HB-232 interface is one of the hottest additions to your scanning shack to take place in a long time. If you have a Radio Shack Pro-2004/05/06 scanner you should consider learning what this interface will do for you.

"It had to happen. Well, it's going to happen. The price of the HB-232 has got to climb a little in order to establish its profit structure and to ensure that it will be available for a long time to come. We've come a long way in the evolution and development of the HB-232 and now that it has become stable, we have to continue development for it in other areas. Basically, it has to be self supporting now so we can turn our attentions to the future.

Accordingly, on March 16, 1993, the price of the HB-232 in all its various combinations and forms, increased by \$25.00 with the basic kit to be \$194.95 + \$5.00 S/H.

By way of compensation for the price increase, we have evolved the manual to a much higher degree of refinement and qualitative appearance. It will soon be bound in a looseleaf 3-ring binder, attractive and functional.

Let me take this opportunity to express my appreciation to all of you who came in early and contributed to the effort. Even those of you who had problems made a significant contribution, for it was through your problems that I learned to anticipate and calculate the most probable causes and most likely remedial actions required to get the show on the road. I am proud of the current evolution of the HB-232 and its manual, and I thank all of you who made it possible to get it to this stage".

## PRO-43 & HB-232 Compatible

The HB-232 computer interface can be made to work with the Realistic PRO-43 with reduced capability from how it operates with the PRO-2004/5/6. The PRO-43 is designed quite differently from the base models and therefore cannot function to the same levels, but the PRO-43 can be autoprogrammed by the HB-232 and it can be controlled from the PC's keyboard! No claims are made as to any other functions, although limited scripts might be made to work. The regular price of the detailed instructions and the PRO-43 program files will be \$49.95 + \$5.00 S/H. (you will need the HB-232 interface in addition to these instructions and files). Orders for the PRO-43 program files and instruction manual are now being accepted. The bottom line is that control & autoprogramming of the PRO-43 with the HB-232 is now a reality. Work will soon be started to adapt the HB-232 to the PRO-32, PRO-34 and PRO-2022. Completion is expected sometime during the second quarter of

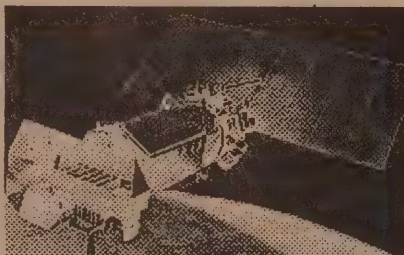
1993. Prices and specifications will be comparable to that for the PRO-43 but orders for these versions are not being accepted yet. Watch for future announcements. Prices and specs given herein are subject to change without notice.

You can reach COMMtronics Engineering at P.O. Box 262478, San Diego, CA 92196 to order the HB232 and "The World Scanner Report". See their ad in this issue of The SCJ.

## PROXPORT

For owners of the "FCC Database" by Grove Enterprises, "ProScan" or "Sherlock" programs by DataFile (see January 1993 Spec-Com Journal for a review of Sherlock) or "HB-232 Scanner/Computer Interface" there's a cheaper and easier way to import and export your data. ProXport! Not only does ProXport import/export these types of data, but also has a built-in "Query Builder" not always found in the more expensive database programs. Priced at \$19.95 ProXport is a real value. ProXport is a fast and easy to use DOS based program for importing and exporting select data from several popular frequency file formats to another. Now you can create or combine files containing just the data you want. You can just move data from one file format to another or back to the same format. ProXport, an IBM-PC/compatible program, requires DOS 3.0 or higher, 640k RAM and a hard disk drive. Compatible import files are "Sherlock, Ver 2.x", "ProScan Ver 1.0", both DataFile, and the "FCC Database on Disk, Ver 1991-92" by Grove Enterprises. The imported data can then be exported back to any of these three data base formats as well as "HB-232", and standard "ASCII" text files. ProXport can either create new files or append to existing export files.

ProXport provides a powerful query function for selecting specific data to be exported. This powerful utility can create and save complex queries for any of the import file types. Operators include "sound like" for data containing spell-

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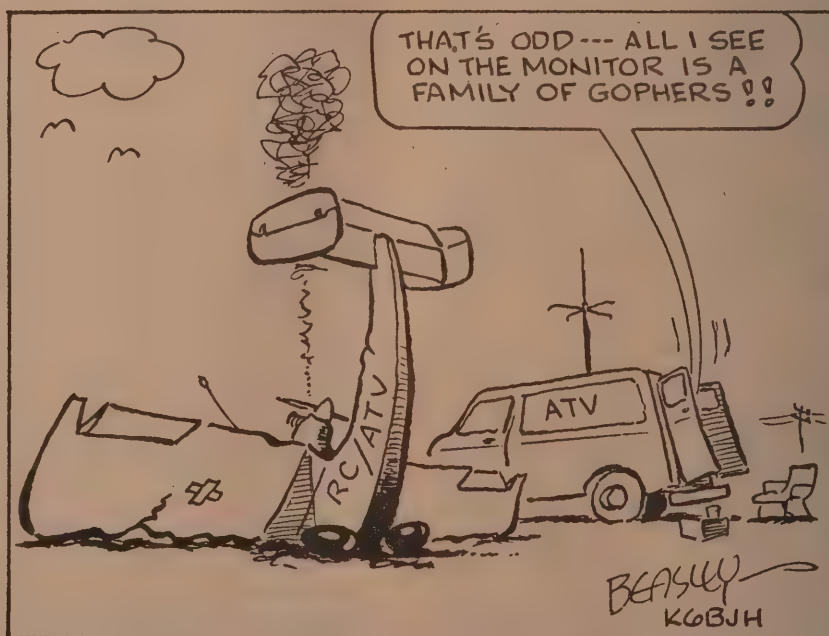
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# THE QRP CORNER

by George Franklin W0AV

One of the problems with operating CW QRP is that it sometimes is difficult to find any activity on the 7040, 14060 and other QRP channels. All too often, there may be so much QRO activity that QRPers get frustrated.

Fellow QRPers, I have a little secret to share with you. Listen on 14056.5 KHz., the Mobile CW County Hunters' Net. Before you tell me you're just not interested in County Hunting, please hear me out.

In the first place, you needn't be a County Hunter to enjoy CHN; any and all stations are welcome to participate. Secondly, participation is simple and really enjoyable once you get into the swing of things; that doesn't take very long at all.

What you will hear on CHN is activity from mobile CW stations handing out contacts from all over the USA. The net is normally active from early morning until early evening, seven days a week. Monitor the frequency for five or ten minutes and you will probably hear Ed, WA6VJP, the regular NCS sending a summary of the mobiles currently active and their counties. Following that you will hear a CHN general call inviting one and all to attempt contact with the /M station. The /M station will repeat the invitation, his call and county/state and a "QRZ?" To participate, simply send your call once and the /M will begin swapping reports with all callers, in the order copied. If you don't make it in the initial "pile-up," send your call sign again when the /M works through his list and sends "QRZ?" again.

The exchange is simple enough. The /M station will send your call and a report, ie. W0AV 559 K. You respond by sending the report just received and your report to the /M, ie. 559 UR 579 K. The contact is complete when the /M confirms the report you just gave and sends another QRZ. Should the /M have trouble copying your signals, not to worry. The NCS will assist in relaying reports back and forth. Usually, a successful contact will result, even when reports are down as low as 229. Sound great for QRP? I can tell you first hand that it is just that.

Now, the thing is that your little QRP rig will do wonders on a net operation of this type. With my MFJ 9020 and simple antenna, I have worked mobiles all over the USA. Using the 9020 /M, I have worked other mobiles nationwide, as well as 4X4, DL4, OK and other DX. You will be amazed and delighted with CHN.

No formal "registration/membership" of any kind is required to participate in CHN. And you don't have to be a high-speed CW operator; send at your usual speed, whatever that may be. Just spend a few minutes monitoring to get the hang of it and then jump right in. The gang on CHN will be glad to help you if you get stuck; they are a great bunch of guys, believe me.

All I can say is, "Try it, you'll like it." You will be glad that you did. After you find out how well your little QRP rig gets out you will have more confidence to operate QRP on any frequency on any band. And, who knows, you just might get hooked on county hunting!

## NEW QRP PRODUCTS

As a long-time ham, I was delighted to receive a copy of MFJ's 1993 catalog, packed with well over one hundred products, including ten or more brand new items. Several of the new items seemed to me to be of real interest to the QRP gang.

The new MFJ-1796 HF/VHF Halfwave Vertical caught my eye immediately. It is a reasonably priced ten-foot vertical antenna covering 6 bands, 40-20-15-10-6 and 2 meters. I especially like the very clever design concept. It requires no ground radials and provides an efficient radiator on 6 meters as well as gain on two meters! It isn't strictly a QRP antenna (it's rated at 1500W) but seems ideally suited for field day and portable operations, two activities of particular interest to QRPers. The only question seems to be why MFJ could not have included 30 and 17 meter coverage, but perhaps that is asking a bit much.

The product which really fired my imagination is the 8100K Shortwave Regenerative Receiver. This little jewel provides almost continuous coverage from 80 through 13 meters in five bands. The circuit consists of an RF stage, regenerative detector and an audio stage, powered by a 9-volt battery, featuring a vernier tuning dial, RF and audio gain controls and band switch. A clever idea is twin earphone jacks so that you and a budding ham can both listen together after assembling the kit. Yes, it is available in kit form as well as completely wired. It would seem to be a fine Elmer project as well as the nucleus of a very inexpensive QRP station. At \$59.95 including an attractive aluminum cabinet and screened front panel the kit is a real bargain. If you haven't tried a simple regenerative receiver, especially one with an RF stage, you will be absolutely amazed at how well it receives AM, CW, SSB, RTTY and Packet. It won't perform like a one kilobuck radio, of course, but you and your understudy will have a barrel of fun assembling and using the 8100. Congratulations to MFJ for marketing a low-cost receiver kit which will undoubtedly fascinate newcomers and old-timers alike. Speaking for myself, a ham for 57 years, I thoroughly enjoy assembling and using well designed kits.

A call to MFJ revealed that these two products are scheduled to begin shipping in mid-December. I guess I can

wait that long, but it won't be easy. I'll just have to be patient, but that regen receiver really has me hooked. It brings back so many fond memories of my early ham days, using a tube-type regen. MFJ's customer service department promised to send me some preliminary technical information as soon as it is available. I will build and test the 8100K just as soon as I can get my hands on one. Stay tuned!

There are several other intriguing new products. Get a copy of the catalog and see for yourself. I think you will be as enthused as I obviously am. It is refreshing to see a U. S. firm so totally dedicated to the ham market, and I especially commend MFJ for introducing low-cost kits which are practical, educational and just plain fun. Keep up the good work, MFJ.

Continued from page 53

## The Scanner Report

ing variations and errors, and "contains" for data contained within a field. Now you can truly customize your frequency lists. For example you can query a database for all records in which the location equals "Denver" or you can query for records in which the frequency is greater than 144 MHz and less than 148 MHz. You can combine these queries together and select all Denver records along with these specified frequencies. You can even get more fancy and also specify only those records whose service codes represent ham. In other words, we can query our database in many different ways and combinations.

Another feature included is automatic file recognition. This detects file existence, format type and compatibility. File status displays file name, date, time and size of both import and export files. Export session status displays number of records processed, remaining number of records to be processed, total number of records processed, num-

ber of file bytes processed and disk space in bytes remaining. Activity window displays data from records as they are exported.

This very well written program is professional in its look and feel. The documentation is clear and understandable. This one is a must have for any of us using frequency management data bases. A demo version of ProXport is available for downloading on The Tri-State Data Exchange BBS (319) 556-4536 and many other fine systems around the country. You can reach DataFile, Inc. at P.O. Box 20111, St. Louis, Missouri 63123.

In the next issue we will review another product by DataFile, Inc. that is really a winner! For simple but flexible database control of your scanner, short wave, or ham frequencies they have released ProScan. Tune in next issue for an look at this software.

## Spread Spectrum

We have received several questions on Trunking Radio Systems and Spread Spectrum Systems. We are presenting a separate informative article in this issue on Trunking Radio. To answer some of the questions about what Spread Spectrum is we provide the following information.

Spread Spectrum has been in use by the military for many years and has been used in the commercial world for over 10 years. Spread Spectrum modulates a signal in a wide band way that provides interference resistance and security. Signals are jumped around in frequency by the transmitting station and the receiving station is programmed to track the signal thus receiving the information. To others listening to the frequency the signal sounds like random noise. The Spread Spectrum signal can take up to 100 times the bandwidth of regular FM or AM signals.

## New Paging Systems

It has been reported that the FCC has

set aside a spectrum of radio frequencies for satellite paging services that will transmit pager message anywhere on earth. This system could also be used to track down missing persons and stolen cars anywhere. The satellites could be launched next year and will orbit a few hundred miles above the earth relaying messages from handheld units.

## Your Input

We need your input with your article, news tips, frequency exchange, product announcements, or construction projects. You can Net Mail to me from 9:00 PM to 6:00 AM Central time at 1:283/611. You can upload or send messages to me at The Tri-State Data Exchange BBS (319) 556-4536 24 hours a day, FAX us anytime at (319) 583-6462 or you can reach us by mail. Please share with the readers of The SCj by your input.

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Photo by Jean, KB9FXL

# Cathode Glow

EARLY TV AND RADIO • by James T. Hawes, AA9DT

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*You're behind enemy lines in World War II, Nazi-occupied France. All you have for parts is a broken Volksempfänger (People's Receiver). You remove just a few components and breadboard a midget, regen set. Then you steal away into the night with the set under your trench coat... To hoist*

## Build This Regen Spy Radio!

*your antenna and sink your ground... To receive your forbidden bulletin from across the Channel... To transmit an acknowledgment... All with this homebrewed marvel!*

### "Almost" a Kit

Do you agree that regens can bring back some of the allure of the hobby? Then join me and build one right now! You can start with a chassis that's already made to order. Radio Shack doesn't have a regen kit anymore (*sin*). But it does have a dandy crystal set that you can modify.

The kit comes with a tuning capacitor, coil and headphone. Build the set. It's really splendid.

### Upgrade to a Regen!

A crystal radio offers reasonably high fidelity. Yet crystal sets aren't very sensitive. You can enhance sensitivity by substituting a detector *with gain* for the diode detector. Regen circuits apply this principle. With good design, fidelity doesn't suffer much.

In the good old days, of course, amplifying tubes provided detector gain. Familiar tube choices included the 01A, 30, 40 and later, the 6J5 and many others. Some

guys even got fancy and used screen grid tubes (*tetrodes like the 24 and 32, pentodes like the 38 and 42*). These offered more gain.

Today, our choices are simpler, cheaper and smaller. We're blessed with field-effect transistors (*FETs*). A FET, "the transistor that thinks it's a tube," performs magnificently in a regen circuit. In addition, FETs need no filament power and cost under a dollar. Radio Shack stocks two very sensitive FETs, the type 2N3819 and the MPF102.

I suggest that you replace the diode in your crystal set with a 2N3819 FET. Follow my schematic until you get your radio working again. For my regen, I assembled a small perfboard with the FET and associated components. This made building easier. *Let's go...*

□ 1. Begin by replacing the detector diode with a gate-leak resistor and capacitor. Use a 470K resistor and a 30pF capacitor.

□ 2. At terminal 2, hook the 2N3819 FET's gate to the gate-leak resistor. Remove the wire

3.

□ 4. Also at the drain terminal, solder one leg of a 470-ohm resistor.

□ 5. Drill a hole for the 1M volume pot and on/off switch. The hole should be above and to the right of the tuning capacitor. (*The battery will occupy the space directly above the tuning cap.*)

□ 6. Solder the drain resistor's free leg to either end leg of the volume pot.

□ 7. Solder the center tap of the pot to the red lead of the battery clip.

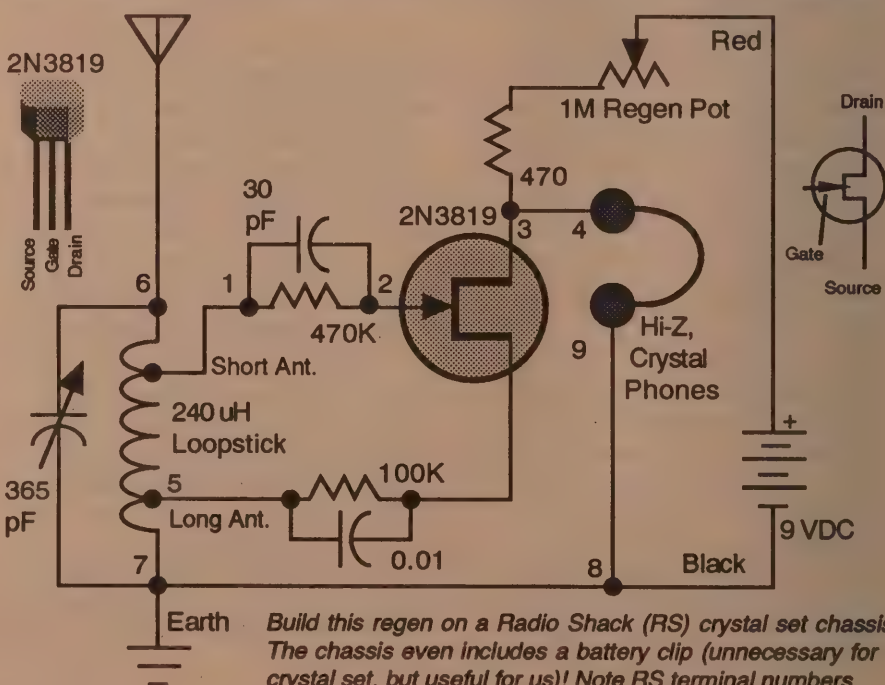
□ 8. Run the black battery clip lead to ground terminal 8.

□ 9. Solder the FET's source lead to a 100K resistor and 0.01 uF capacitor in parallel.

□ 10. Solder the free end of the resistor and capacitor to the "long" antenna terminal, 5.

□ 11. Run the antenna wire to the tuning capacitor at terminal 6. Don't forget to wire a ground, too. Now take a moment and check your work against my schematic.

□ 12. Turn on your masterpiece!



between terminals 2 and 3.  
□ 3. Attach the FET's drain leg to the ear-phone terminal marked

(Insert a battery.) As you tune stations, turn the regen pot to maximum. Listen for a rushing or whistling sound. When you hear the rushing, trim back the regeneration until a station comes in. Be prepared to yank the headphone out of your ear. Some strong stations may cause the set

to "bloop"! That can be painful. But soon you'll learn how to "steer" this set, and you'll seldom be surprised by having the regen up too far.

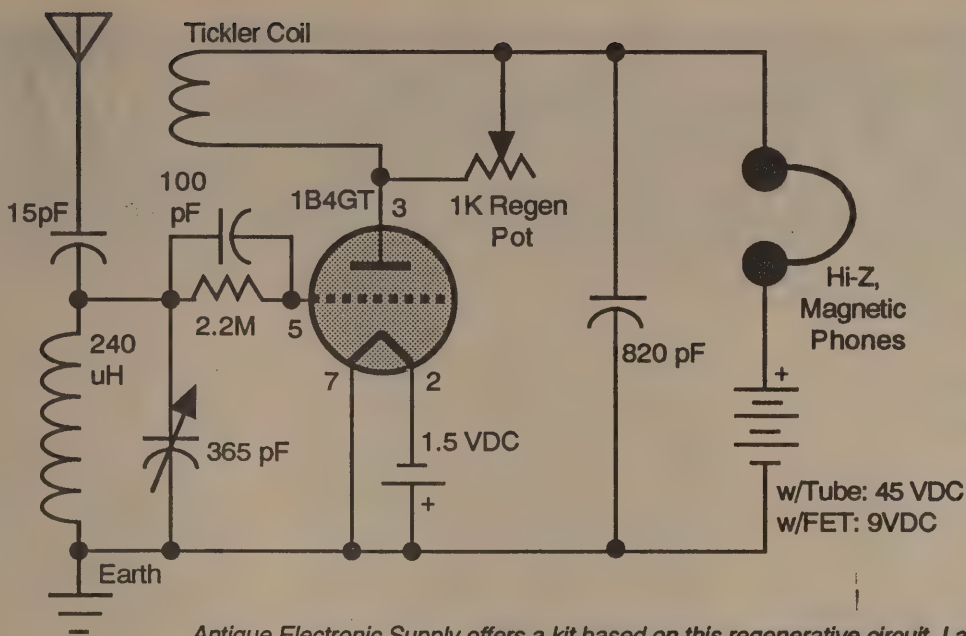
This circuit behaved well for me, even with Chicago's nearby, strong stations. The radio never blooped. If your set distorts though, try increasing the source resistor or regen pot resistance. You can increase either one by a factor of 10 and the circuit will still work. Yet you may notice a decrease in volume. Also try a different antenna at either terminal 1, 6 or 5. *Make sure that you have a good ground connection.*

I don't recommend increasing the gate resistance. In my experiments, doing that made the regen pot more critical.

## Regens with Tubes

Suppose that you want to build a "real" regen, with tubes... Try the neat little kit from Antique Electronic Supply in Arizona. The kit includes all the parts, even the 1B4GT tube. You get a breadboard and an expertly written instruction manual. You'll also have to buy a 45-volt battery, but Antique Electronic has those too.

The little set really works well. We had to replace a faulty regen pot in ours, but that's purely incidental when you have a well-stocked junkbox! The kit tunes



Antique Electronic Supply offers a kit based on this regenerative circuit. I also tried the circuit with with a FET. It works fine either way! See the end of this article for AES's address.

smoothly, giving the myth to the notion that regens are universally cantankerous about tuning.

I also rigged up a "solid tube" for this kit. I wired an MPF102 FET to two-inch wires soldered into an octal tube base. With my "solid tube," the set's B voltage requirement dropped to nine volts. If you try the FET, remember to change the "B" battery!

I inserted the FET contraption into the 1B4GT socket and the FET served excellently. The set played louder with the MPF102, but I noticed more instability. The FET's impressive gain probably caused these effects.

Undoubtedly I should have restricted gain with a source feedback resistor. Or maybe I should have connected the source to the negative 1.5-volt filament supply. I'll leave that to you.

## Experiment! Customize!

If you can think of a way to make these circuits better, write! I'm working on audio amplifiers for them. Also on new coils to extend tuning to the shortwave bands. An rf amplifier for the front end might be nice, too. An amp would eliminate instability and isolate the oscillator from the antenna. That means happier neighbors and less unpredictable oscillation due to antenna length and wind. Of course, we can go crazy and make

the circuit too complicated!  
*Good Scanning! --AA9DT*

## Regen Sources...

### KITS & LITERATURE

Antique Electronic Supply  
688 W. 1st Street  
Tempe, AZ 85281  
(602) 894-9503

Yeary Communications  
12922 Harbor Blvd. #800  
Garden Grove, CA 92640

### PARTS & LITERATURE

Fair Radio Sales  
P.O. Box 1105  
1016 E. Eureka Street  
Lima, OH 45802  
(419) 223-2196; fax (419) 227-1319

### RADIO, CIRCUIT BOOKS

Ken Cornell, W2IMB  
225 Baltimore Avenue  
Point Pleasant Beach, NJ 08742  
(Low and Medium Frequency Radio Scrapbook. Third edition includes regen circuits.)

Lindsay Publications  
P.O. Box 12  
Bradley, Illinois  
(815) 468-3668

Vestal Press  
320 N. Jensen Road  
Vestal, NY 13851-0097  
(607) 797-4872

# A Time Remembered

## by George F. Franklin / W0AV

### A GREAT YEAR FOR NOSTALGIA

This is a great time to be a radio amateur. It doesn't matter whether you are a grizzled OT or a new "no-coder."

We have bands galore, some hardly used. New modes are here, inviting us to explore them. Each issue of the many ham radio publications features an array of tempting ads extolling the mind-boggling features of new products.

But right along with all this state-of-the-art glamour, it is downright exciting for an old-timer to read current build-it-yourself articles on such things as single tube regenerative receivers and Hartley oscillator transmitters. I was delighted to see a new MFJ ad featuring a five-band solid-state TRF regenerative receiver, available in kit form or factory wired. This is an intriguing mixture of old and new technology; the best of both worlds, so to speak. The wording of the ad brings memories of the early thirties flooding back for savoring sixty years later.

There was real magic in those days long past, when a typical ham station consisted of a one to three tube regen receiver and a single-tube transmitter, all home-brewed. In those days, most of us built our receivers on a white pine board with an aluminum panel. The aluminum panel was a necessity, to avoid the dreaded "hand capacity" effect. A non-metallic panel made it almost impossible to keep a regenerative receiver tuned to the desired signal. The transmitter was usually built

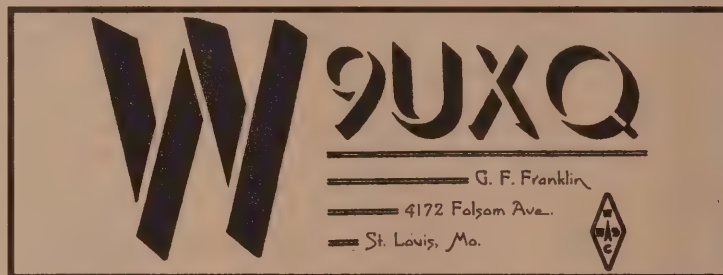
on a "breadboard," without the nicety of any sort of panel at all. Everything was right out in the open, for all to see and admire. Starting with the oscillator at the left and ending with the final on the right. Breadboard wasn't just a euphemism; a dime-store breadboard made a really neat "chassis" for the popular oscillator-buffer-final 50 watt rigs. Very popular final amplifier tubes were 45's, 46's and 210's. The type 47 was the undisputed choice for a crystal oscillator. For the AM phone operator, the type 50 tube as Heising modulator was cheap and very effective. More affluent hams preferred push-pull 46's as Class B modulators, requiring a pair of ex-

pensive input and output transformers (Thordarson or UTC). The big boys went for the 203A PA and a pair of 211's as Class B modulators, but they were in a world far removed from mine.

Today's digital displays and back-lit controls do not create that magical aura that pervaded the old-time shack, with its tube filaments. State-of-the-art linears today simply can't compete with those old final amplifier tubes, brilliant filaments illuminating the shack, mercury rectifiers pulsing with keying or modulation, power transformers groaning. The old magic just isn't there any more.

Antennas then were usually quite simple. Yagis were unknown, coaxial cable hadn't yet been invented and the "doublet," random wire and "Zepp" reigned supreme. The poor man's doublet was a center-fed dipole using green-yellow, twisted lampcord for the feed line along with glass antenna insulators, all from the local dime store. The popular "end-fed Zepp" was replete with open wire line, spacers made from six-inch dowel rods, boiled in paraffin to improve their wet-weather insulating qualities. Incidentally, many a kitchen catastrophe and domestic dispute resulted from those boiling episodes, as you might surmise. Some of us preferred the half-wave wire, off-center fed with a single wire feeder. An advantage of this design was the fact that the feeder could be alligator-clipped to the output tank coil of the transmitter; no antenna tuner was required. Woe to those who failed to insert the mandatory mica "blocking capacitor" at the clip, resulting in an antenna system hot with RF and full B+ from the transmitter!

Handbooks warned constructors of these early rigs to beware of the "swinging antenna effect" on regenerative receivers and single-tube self-excited transmitters. This resulted in random frequency excursions as the antenna swayed in friendly breezes, making for extreme difficulty in maintaining communications. Another "no-no" was "tight coupling" to a transmitter, which resulted in frequency pulling, chirping CW signals, splattering AM signals and other undesired effects. This brings to mind the classic reply of a local 160 meter AM operator with a notoriously



broad signal. When accused of using tight coupling, he vigorously denied the charge. In fact, he stated, the alligator clip connecting the antenna feeder wire to the tank coil was so loose it jumped off every time a street car passed.

In those days, test equipment was quite cheap and readily available, just as long as you didn't insist on such niceties as panel meters. The average ham used the "soup loop," to determine that amount of RF output from the one or more stages of his hand-crafted transmitter. For the uninformed, a soup loop consisted of a Christmas tree lamp and a three-inch loop of insulated wire. The purist might use a #47 pilot lamp or a flashlight bulb for greater sensitivity. By coupling the soup loop to the various tuned circuits in the rig, the amount of output could be determined. The big boys, of course, used one or more 100-watt lamps for a dummy load. It gave Joe Ham a sense of power and authority to see a lamp pulse with modulation or follow CW keying, believe me. Another inexpensive tester was the lead pencil, used to draw sparks (or arcs, if you were QRO) from the tube plate cap (highly dangerous) or from the Zepp feeders (relatively safe). I recall a local ham who astonished visitors by drawing a four inch arc from his final tank, using a center carbon from a number 6 dry cell taped to a broom stick. A somewhat more expensive but exceedingly fragile tester was the neon lamp. Unless one took elaborate precautions (I usually didn't) it was sure to roll off the ham table and smash on the floor; a fiscal disaster. At around a Dollar apiece, neon lamps were not for those on mini budgets. It was great fun, though, to peak a tank or antenna circuit with a neon bulb. Also, it was handy to find out if your desk mike was hot with RF before burning your nose on it. Most of us really didn't need voltmeters or milliammeters in those days to ensure that our rigs weren't exceeding the one KW legal limit. We simply tuned for maximum soup in the tank and verified proper operation with the trusty arc pencil. Measuring one's

frequency was also an unnecessary luxury in most cases. The transmitter frequency was stamped right on the crystal! When using a VFO (called an ECO back then) we merely zero-beated the station we wished to contact and assumed that he was inside the band. What could be simpler? As far as measuring amplitude modulation percentage to avoid overmodulating, the locals were ever alert to inform and/or threaten you without delay when you splattered; cheap and effective modulation limiting. The rule of thumb was to turn the mike gain as high as possible without feedback, watching the soup loop lamp surge on modulation peaks. Unless listeners could hear household noises such as doors slamming, floors creaking, dogs barking or toilets flushing, conventional wisdom dictated that you were a bit shy on mike gain.

Ah, yes, those were wonderful days. It didn't take much money or effort to obtain a ham license and get on the air. On the other hand, contrast what we have now with those primitive rigs of years long past. There simply is no comparison. The effort required today is perhaps less than it was back then. We are privileged to live and ham in a fantastic, modern world. Let's make the most of our great hobby.

## SHORT WAVES

I must have been in the eighth or ninth grade in St. Louis back in the mid-thirties when my school pal Bob discovered a magazine called "Short Wave Craft." We didn't suspect it at the time, but both our lives would be influenced by that publication.

Bob was excited about a build-it-yourself article describing a one-tube super-regenerative receiver built in a small metal cash box. The article said that with this little radio and its self-contained batteries you could hear short wave broadcasts from far away countries. It was entirely portable with a two-foot wire for an antenna. Remember, this was at a time when most radio receivers of any kind were too heavy for two kids to lift.

Bob got busy right away. He purchased a type 30 tube, a socket, a Hammarlund Startuning capacitor and the few other parts required. The set was powered by one 22 1/2 volt "C" battery and two flashlight cells. One day he showed up at school with his little green metal box, a pair of Trimm headphones and with only the dangling wire let me listen to the BBC in London. I'll never forget the sensation, standing in the playground listening to Big Ben on that "magic box."

Bob showed his treasure to our science teacher and calmly stated that he could pick up foreign broadcasts on the tiny box. After hearing the BBC for himself, the teacher thanked Bob politely, but told him that he knew it was some sort of trick.

It didn't take yours truly long to scrounge up the parts to build a "magic box" of my own. My metal box was just a bit larger, and my earphones less exotic, but sure enough, I could pick up those distant stations speaking strange languages. I'm not sure what SW BC band we were listening to as we simply followed the coil-winding instructions in the magazine article. Bob and I could always draw a crowd at school or anywhere else with our state-of-the-art super-regen radios. The performance was incredible, and for some unbelievable.

Bob gave me a couple of issues of Short Wave Craft to read, and I found a fascinating article describing a home-brew two-tube regenerative receiver with plug-in coils to cover the BC band through 20 meters. I was spellbound as I read the author's description of the initial testing, instructing the builder to carefully turn up the filament rheostat in a darkened room, stopping when the two tube filaments glowed a dull red. He promised that a smooth hissing noise would confirm that the detector had "slid into oscillation." One had only to connect a random wire and tune in the world of short wave radio. I was hooked and could already imagine myself hearing voice and code signals from all corners of the globe. This

would be a world infinitely greater than that of SWBC stations I had heard on the "magic box" super-regen receiver.

I showed my Dad the magazine article and he said he had heard about short-wave receivers from a friend at work. The next day Dad said that his friend had recommended a small radio repair shop on Easton Avenue in St. Louis. The proprietor, Dad's friend assured him, knew all there was to know about such things. That very evening, Dad and I went to the shop to see for ourselves. It was a real "hole in the wall," stacked with dozens of BC receivers in various stages of disrepair and all sorts of nondescript items, most of which I couldn't identify. The man told Dad he didn't have any short wave receivers, but that he could build one and have it ready to go in a week. A deal was struck on the spot. I never did know what it cost Dad, but I it was about ten bucks, not an insignificant sum in those days. I counted the days until the evening Dad said that my radio was ready to be picked up. We lost no time in getting to the shop; I saw to that. When we arrived, my short wave receiver was on the workbench and voices and music were emanating from the headphones. The radio man put the headphones first on my Dad and then on me. I very gingerly tuned the dial back and forth. The little set was alive with stations at every setting of the "vernier" dial. Dad and I were more than satisfied, payment was made and we headed for home with my first real shortwave radio.

I

can still picture the little set. There was no cabinet. It consisted of a 6 X 8 inch aluminum panel with a hand-bent chassis. There were three controls; a vernier tuning dial, a regeneration knob and centered above these two, a knob connected to the filament rheostat for the type 30 tube. On the back drop of the chassis were two jacks for the ear-phone pin tips and a homemade four-wire cable power cable. The set was powered by a number six dry cell (filament) and my Dad's old "B-eliminator," left over from his earlier radio tinker-

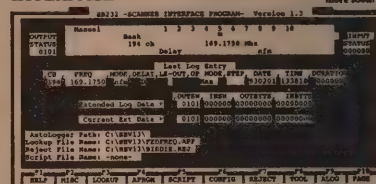
ing days. There was an antenna trimmer, needed to compensate for dead spots on the dial. I think it was in the upper left-hand corner of the panel. I'm not certain about that; this was about sixty years ago, so please bear with me. On the chassis were the type 30 tube and a four-pin socket for the plug-in coil. The coil forms were color-coded, by band. Each coil covered a span of many megahertz.; It took me some time to discover what could be heard on each coil and at what time of day or night to listen. With my makeshift basement antenna, I got excellent reception of hams on 75 meter AM phone. I derived many hours of pleasure and wonderment listening to them describe their rigs, antennas and general exploits. I knew then that I simply had to become a ham myself, although I had no idea what all that might entail.

Bob beat me by three months in getting his ham ticket in 1935. From time to time I hear from him and yes, he is still active in ham radio with his current call, K6QA. The next time we talk I must ask him if he remembers that little green "magic box." I have no doubt that he does.

de George/W0AV 10/15/92

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Also available from ATVQ are BATC (British Amateur Television Club) publications including ATV Compendium, ATV Introduction, SSTV Handbook, CQ-TV subscriptions and VHF Communications subscriptions, video tapes, coffee cups, ATV shirts and more. Write for catalog.

# Spot Light On The Tri-State Data Exchange BBS

## The Tri-State Data Exchange

Last year, an announcement was made in this magazine concerning the NEW BBS home of Spec-Com magazine. Due to the closing of the Electric Cottage, Spec-Com moved their BBS operations from the Electronic Cottage to the Tri-State Data Exchange. I am pleased to announce that the move was a successful one for all concerned, and that the BBS has grown at a rapid pace since then. It is fast becoming one of the most popular BBS's of it's kind.

Due to the increased number of callers, we have recently installed a second phone line and a new US Robotics Dual Standard modem. This will make it easier to get online and provides connect speeds of up to 16,800 bps on one line, and 14,400 on the other.

Another new feature since last year is the ability to send and receive InterNet mail. Callers may now send and receive mail to users on many of the commercial services (Genie, CompuServe, America Online) as well as to colleges, universities, the military, etc.

Some of the other features we offer are an extensive library of Public Domain and Shareware Software, and a CD-ROM library with over 13,000 files available for download, with a section dedicated to Ham Radio, Scanners, ATV, Mods, Satellite, etc. We also belong to the Shareware Distribution Network (SDN), UtilNet, WindowsNet (WIN\_NET), FERNWOOD (OS2Net), and the Ham Distribution Network (HDN). This means that our file areas are always being updated with new

software direct from the authors.

We are also a member of FidoNet and RadioNet, and offer a wide variety of national and international Echomail areas. These areas cover many topics and can be a vast resource of information. Areas of interest to our readers include Ham, Scanner, ATV, Satellite, Mods, etc. We also have several specialty conferences for users of the HB232 interface, and for readers and authors of Spec-Com Magazine. Through the use of the message areas, you may communicate with people all over the world who share your interests. Netmail is also available for sending private mail between points anywhere in the world.

One area of the BBS is dedicated just to professional and amateur radio enthusiasts, and is sponsored by Mike Donovan and Spec-Com Magazine. A wide variety of specialized communications interests are supported in this area including Scanradio, Ham, Shortwave, ATV, Wefax, etc. There is also an online database available with call signs, scanner freqs, and more.

For the fun-loving types, we have a wide variety of online entertainment available. We have poker games, blackjack, space trading adventure games, trivia contests... the list goes on and on. All Ham and Radio related portions of the BBS are available to the public at all times, courtesy of Spec-Com Magazine. All of the other areas are available to new callers for a 30-day evaluation period. During the evaluation period, users will have FULL access to ALL features for 60 minutes per day. At the end of the 30-day evaluation period, users are asked to help support the BBS by paying an annual membership

fee of \$25.00. Membership entitles users to access ALL areas of the system for up to 90 minutes per day. Those who choose NOT to register will still have access to many areas, but will be limited to 30 minutes per day. As you can imagine, the BBS requires a large investment in equipment, phone bills, and time. All registration fees are used to help offset the costs of running the BBS.

I hope that you will call and explore our system. BBS'ing will provide you with hours of enjoyment, and with tons of valuable information. To log on, call via modem at the number listed below, or call the voice number for more information.

Pat Powers Tri-State Data Exchange  
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for more information



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## CDROM

CDROM (Compact Disk Read Only Memory) disk drives have become the must have accessory for the 90s computer enthusiast. CDROM's have been several years. It wasn't until a recent drop in prices of drives and availability of software on CD that the CDROM became more commonplace. Many larger computer systems are now using CDROM as the only software distribution method. For DOS based machines they are still a medium priced option with a price tag starting around \$200.

Beyond playing normal audio CD's, and a single CDROM disk can contain about 700mb of data. Many larger public domain software vendors are now providing massive collections of software on a single compact disk. Many popular commercial packages are now available on CDROM and traditional floppy disk.

Now what does this have to do with Ham radio? Try this? Lookup the call N8EMR in the callbook. Its not that difficult assuming you have the current three inch wide callbook. Flip to the eighth call area and look down the page for the EMR. How about trying this one? Your neighbor wants you to lookup his old friend named John Doe. John lives in Florida and his callsign has a seven in it. Now if you have a lot of free time on your hands and very good eyes you can go through each page of callbook and do the search manually. If you're a "Mr tech'o" you whip out a compact disk, slide it in the cd player. Type a couple of commands, watch the light on the cdrom drive blink and then up pops the answers. How did he do that you ask? It's easy with a little help from the Buckmaster HAMCALL CD. Buckmaster Publish-

ing of Mineral Virginia has been offering for several years a CDROM with not only a complete callsign database, but many amateur radio related files. Buckmaster publishes their "HAMCALL" CD twice a year. The first yearly issue comes out in spring just in time for the Dayton Hamvention and then again in the fall. I have purchased the last three issue of the HAMCALL for use on my BBS. My main use was for the FCC callsign database but I usually can find several new files and programs as well.

The October 1992 HAMCALL CD-ROM is priced at \$50 plus \$5 shipping and has a satisfaction money back offer. The HAMCALL boast over 200,000 International calls, 570,000 US listings, 100,000 cross referenced US calls and 15,000 PC files. I have found the HAMCALL to be useful, but not the "thrill a minute" I was hoping for. Problems started right off the bat. I had problems with the callsign database NOT working in a networked environment. I could access the CDROM and run the programs, but I would get various database errors. None of the issues I have purchased would work in using either a Novell or PCNFS network. Calls to Buckmaster about the problem resulted in little help. Their typical reply was it should work or its works ok here. Since most hams don't run a networked environment at home, this should be of little problem. In a non-networked environment I was able to do the callsign lookups with out any problems. Testing was done on a bargain basement CDROM in an XT and then on a higher quality drive in a 486 with 16bit SCSI controller. The lookup time was acceptable on both machines. Actually there was little improvement on the faster machine since most of the delay was in the CDROM drive.

## WHAT DO YOU GET ON THE CD?

The raw ASCII callbook is available in a fixed field length file that takes up about 89mb. If you get rid of the fix field padding you can get the ASCII file down to about 45mb. At this size the file becomes more manageable but does require moving the data to your hard disk. The supplied HAMCALL lookup software is usable but not the greatest. If you have your own database program you may find that you can make better use of the raw FCC callsign data.

## WHAT ELSE DO YOU GET?

There is also a station cross reference file that is about 88mb and an International callbook that takes up about 113mb of space. The international and cross reference data file is in an encrypted file and is accessible using only the provided access programs. This makes the cross reference and international database useless for anyone not using the supplied programs. It also makes linking the database to your own programs difficult. When using the supplied software you can do callsign lookups. Each lookup can provide you with a callsign, birth year, license class, license expiration data, latitude, longitude, elevation, country, time zone, area code and station address. Note that the latitude, longitude, elevation, time zone and area code are best guess's based on your mailing address.

## AND IS THERE MORE?

Yes there is! While the reference to 15,000 files in the news release turns out to be a bit misleading. That number sounds good but is only valid if you

unzip everything on the CDROM. Since you can't unzip the files on the CDROM you will need to move them over to your hard disk. With more than 680mb of zipped files you better have a BIG hard disk if you want to unzip everything simultaneously.

What you do get on the CD is 1479 files with 1190 zip files. With that many files it's sometimes hard to keep track of them. Earlier HAMCALL CDs had a problem in this area. Files were throw on the CD in an adhoc arrangement. Often the same files appeared two or three times. The latest CDROM has corrected this problem and files are arranged into seven sorted sub-directories. There are still a few duplicates but they are rare. A master list of files is included on the CD. This list doesn't show the file sub directory and I did find a few files that didn't appear in the list. It does however offer a good quick reference as to the use of each file. With the sheer number of files on the CDROM, every aspect of amateur is covered. Non-hams will find several license exams test, morse code tutors and learning aids. The CD contains hundreds of packet relates files, everything from simple terminal programs to complex networking and bbs programs. Satellite users will find tracking programs and operating aids. Regardless if you're a once a week operator or a multi-million point contest operator you can find a logging program to fit your needs. Want to expand the receiver range on that new handheld? Several hundred mods for many popular radios can be found. How about automating your station? The CD offers many control programs for modern HF radios. Even the non ham radio enthusiast is covered. Scanner and SWL's will find programs, tutorials, operating tips, frequencies list and broadcast schedules. If you're interested in the technical side of radio you can find antenna design programs, electronic layout programs and circuit analysis programs to meet even the most demanding applications.

## WHAT COMPUTERS ARE SUPPORTED

Most of the files I have mentioned been geared towards DOS based machines. There are some windows programs, a couple OS/2 programs and a few programs for the atari, COCO and C64. The one area that has been updated in this latest issue of the HAMCALL is the Macintosh area. My experience and access to MAC's is limited so I had to depend on a couple of MAC fanatic friends for their help. The MAC files are included in a single 20mb STUFFIT file. It seemed a little strange to have such a large archive. While it appears not to be common in the MAC environment, Some CDROM producers are using the large file scheme. My MAC "experts" however recommend that the files should be broken down in to much smaller topic oriented STUFFIT archives or broken down by specific program. Programs included in the MAC archive are similar in function to the DOS counterparts. There are however fewer files to choose from.

## OVERVIEW...

The Buckmaster CDROM has a lot going for it. It's reasonably priced, has an updated callsign database, a large selection of files. If your looking just for files you can spend many times the cost of the CDROM in long distance or on-line subscription charges downloading just a small fraction of the programs. I don't think I would buy both the spring and fall CDROM each year just for files, but even if you do you cost is still small. You also might look for older issues of the CDROM at hamfest. Previous HAMCALL CD can often be found for under \$10.

If your looking for callsign database then Buckmaster has your solution. Twice a year updates, international lookups and the many cross references if you use the supplied lookup programs. If you don't mind your HAMCALL tying up your CDROM all the time then This CD is for you. About the only suggestions I would have for

the Buckmaster publishing is to considering a yearly or two year subscription rate to the HAMCALL CD. I also would like to see the files logically grouped by function instead of name.

## OTHER CHOICES.

I have only seen a couple other CDROM's with ham related files. ERM liquidating is offering a \$19 CDROM with ham files, but haven't found anyone who has a copy. If you have a copy I would be interested in hearing whats on it. I did see another ham CD priced around \$80, but from the list of files I don't think its worth it. Rumor has it that several USENET hams are putting together an FCC callbook and files CDROM. I Will let you know more when I get the info? If CDROM's are not your bag or you haven't splurged for one yet you can get callsign databases from several company's on floppy. Cost are in the \$40-\$50 class and only includes the FCC data. No cross reference data or ham related programs are included.

## HAM BBS LIST

I just finished the N8EMR 1993 Verified HAM Radio BBS list. Over the past few months I have been slowly attempting to verify the hundreds of so called ham radio BBS's. Besides updating my list from last year, I attempted to verify several other lists floating around the various computer networks and inerge them into a "one-stop" quality list. I still have many new systems to add to the list but it will take some time to verify each of these these systems. Look for those systems in future articles.

What I found is that most list are JUNK! I called over 600 phone numbers of what other people reported to be ham radio BBS's. Of the 600 systems, about 200 were actual operating BBS's. The rest of the systems were either disconnected, no answer, or answered with voice. A few were actual BBS's but had nothing to do with ham radio. Please, If you maintain any BBS list of

any kind, don't just add a number. Verify it first! Some phone numbers I attempted to call were outdated by as much as five years.

The format for this year's list has changed a little since last year. The list is colon separated and has eight fields. The fields include Phone number, BBS name, sysop name or call, city, state, rating, date last verified and any comments. Most of the fields are self explanatory. The rating field is used to indicate in a very subjective way how good or bad a system is. Top notch systems are rated with a "!" and generally have a large number of file or messages areas plus some service such as call sign lookup or gateway to packet. The next level is most common and is denoted with a plus sign "+". This type of systems would have files and messages areas of interest to most radio operators. The dollar sign "\$" marks systems that require payment for access. Many systems do ask for donation but only systems that require up front money are marked as payment required. Some rating fields may contain two references. These are usually systems that had been rated in the past, but I was unable to re-verify in the last couple of months. (E.G. "B!") Would show a system was rated excellent once but on the last call line was busy.

## CODE REFERENCES USED

- (!) An Excellent Rated Electronic Information System
- (+) Verified, Online, Offering both Files and Messages
- (-) Verified, On-Line but offering minimum Ham service
- (?) Heard about: Non-Verified: Unknown System
- (\$) Payment Required for access
- (M) System Primary function is Messages
- (B) Not verified, Line is continually busy: Assumed online.
- (S) Specialty BBS
- (function) (N) Non-HAM, no answer, Voice answers or disconnected.

**N8EMR HAM RADIO BBS. Copyright (c) Gary W. Sanders N8EMR Rights granted for electronic retrieval as long as file is kept in original form..**

**Gary W. Sanders gws@n8emr.cmhnet.org, 72277, 1325 N8EMR@N8JYV (ip addr) 44.70.0.1 [Ohio AMPR address coordinator] HAM BBS 614-895-2553 (1200/2400/V.32/PEP) Voice: 614-895-2552 (eves/weekends)**

201-387-8898:R.A.T.S. BBS:??NJ+:11/30/92:rose code  
 201-694-8122:Sonnet Center:n2rbj:Wayne:NJ:-:11/30/92:  
 201-941-3302:B.F.W.K.:KB2JXK:Cliffside Pk:NJ+:11/30/92:Arrl section support  
 203-261-6434:Trumbull Mini BBS:WA1QKS:Trumbull:CT:M:11/30/92:  
 203-431-4687:Source of Magic?:Ridgefield:CT:-:8/5/92:poor ham system  
 203-438-9908:Orions Nebula:N1CUI:Ridgefield:CT:-:11/30/92:  
 203-563-6455:Hart-Metro Opus?:Whethersfield:CT:B:11/1/92:  
 203-665-0578:ARRL BBS:W1AW:Newington:CT+:11/30/92:new #, 4 lines(was x0090)  
 203-846-3522:NORAD?:Norwalk:CT:-:11/30/92:  
 203-888-8375:Dave's Bar & Grill:KD1BD:Derby:CT:B:11/30/92:  
 204-785-8518:Bills BBS:VE2UB?:Canada?:11/30/92:  
 205-774-7453:Ham Shack:?:AL+:12/5/92:  
 205-853-6144:Bham Sperry:Jack Efird:Birmingham:AL:B:11/1/92:  
 205-895-0028:NASA Spacelink:B.Ande:Huntsville:AL:!:11/20/92:  
 206-355-1295:The Precedent:N7NIP?:WA:-:11/30/92:  
 206-566-1155:AmoCat BBS:Rich Langsford:Tacoma:WA:B:11/1/92:  
 206-672-8989:A.E.A.:Andy:Lynnwood:WA:M?:11/30/92:little info of use  
 207-495-2490:I.A.R.N.:K1MAN:Belgrade Lakes:ME:-:8/13/92:Only IARN info  
 214-226-1181:Comport 1:wa5eha:Dallas:TX:!:7/15/92:  
 214-394-7438:Datalink AMSAT:N5ITU:Dallas:TX:!:11/30/92:public line  
 214-492-7154:Datalink AMSAT:N5ITU:Dallas:TX:\$:11/30/92:sponsors line  
 214-492-7438:Datalink AMSAT:N5ITU:Dallas:TX:\$:11/30/92:sponsors line  
 215-584-1412:System-2?:Norristown:PA:-:11/30/92: 2  
 16-237-8208:B.A.R.F. BBS:???:OH:B+:12/5/92:  
 216-526-9480:AMCOMM (1) of 6:BPois:Cleveland :OH:\$:12/5/92:  
 216-545-0093:Steel Valley Opus?:Girard:OH:B:11/1/92:  
 216-661-9065:Comstar:Roger Dye:Cleveland:OH:B:11/1/92:  
 216-688-5003:Cleveland BBS?:Cleveland:OH:N+:12/5/92:no-ans  
 216-777-4569:Connections II:Ryan Wilkins:Cleveland:OH:B:11/1/92:  
 216-867-6984:Buckeye Ham Shack:???:OH:B\$:12/5/92:  
 216-942-6382:Cleveland HamNet:w8sqy:Cleveland:OH+:12/5/92:  
 216-942-6382:Cleveland Hamnet:w8sqy:Cleveland:OH+:12/5/92:  
 216-942-7516:Cleveland HamNet:w8sqy:Cleveland:OH+:12/5/92:  
 216-951-4287:Eastlake:Ken Bayko:Cleveland:OH:B:11/1/92:  
 301-590-9629:3 Winks RBBS:W3INK:Gaithersburg:MD+:11/30/92:public  
 301-593-9067:PC-Ham BBS:G3ZCZ?:MD+:11/30/92:  
 301-645-7964:Diamond Jims:?:MD:NA:11/1/92:  
 301-670-9621:3 Winks:W3INK:Gaithersbur:MD:\$:11/30/92:  
 301-725-1072:F.C.C. Hotline:FCC:Washington:DC:S FCC files:7/25/92:old data  
 301-831-5954:WJ3P Exchange:Lucas Spiros:Mt. Airy:MD:NA:11/1/92:  
 303-497-5000:NOAA:US Govt:Boulder:CO:S propagation:7/20/92:  
 303-497-5042:NOAA 3 line rotary: Boulder:CO:S-propagation:11/1/92:Mutliline  
 303-534-4646:File Bank:?:CO:\$+:11/30/92:effective 1/1/93  
 303-534-4646:The Comm-Post:BBartee:Denver:CO:\$:11/30/92:  
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 305-828-7909:Telcom Central Fido:Ray Vaughn?:FL:!:11/2/92:Broadcast and ham  
 305-836-0463:Head Start Fido:N4ETS:Hialeah:FL?:11/2/92:  
 310-370-4113:Long Island RB:?:CA:B:11/1/92:new AC 310-374-7929:PC Heaven

BBS:N6XQU:Redondo Bch:CA:11/30/92:new AC  
 310-420-9327:The QED BBS:KC6SCN:CA:8/13/92:Waffle/file req validation  
 310-541-2503:WB6YMH BBS:WB6YMH:Palos Verdes:CA:11/30/92:NEW AC  
 310-761-8284:Kenwood Radio Inc:Kenwood:Long Beach:CA:11/30/92:  
 312-790-0187:Cope of Chicago:KB9X:Chicago:IL:B:12/2/92:  
 313-649-6213:Blue Water TBBS:Birmingham:MI:B:11/2/92:  
 313-879-7387:The Black Hole BBS:N8MAX:MI:B:11/2/92:  
 314-837-5422:Cindex Tech Support:KB0FMQ:Florissant:MO:B:12/2/92: 3  
 14-965-0477:Cat Box BBS:MO:B:11/2/92:  
 315-492-6672:OCC Micro Support:Bob Arnold:Sracuse:NY:7/26/92  
 315-695-4070:Phoenix High School:NY:B:11/2/92:  
 317-353-9981:Someplace BBS:Mike Shepard:Indianapolis:IN:B:11/2/92:  
 317-535-9097:SouthSide Fido:KB9BVN:Indianapolis:IN:11/2/92:  
 317-535-9097:Southside BBS:KB9BVN:Whiteland:IN:7/24/92:HDN files site.  
 317-882-4454:IBM-Net Connection:Rex Hawkins:Indianapolis:IN:\$11/2/92:  
 317-882-5575:IBM-Net Connection:Rex Hawkins:Indianapolis:IN:\$11/2/92:  
 318-443-0271:Am. Silver Dollar:WB5ASD:Alexandria:LA:12/3/92:  
 318-688-7078:The Swamp:Mike Berry:Shreveport:LA:11/2/92:Very slow  
 318-797-8310:Net 380 Host:LA:B:11/2/92:  
 319-556-4536:Tri-State:Powers:Debuque:LA:12/13/92:speccom home :multiline  
 401-331-0334:ChowaNet #1:B.Shipp:B:12/3/92:  
 401-331-0907:ChowaNet #2:B.Shipp:B:12/3/92:  
 402-289-4658:Aksarben ARC BBS:WB0QPP:Omaha:NE:B:11/7/92:  
 404-363-1640:Hams Bulletin Brd:WA4CBT:Forest Park:GA:B:12/3/92:  
 404-487-1376:Command Post:N4YTR:Peachtree-city:GA:11/7/92:  
 404-929-0800:Atlanta Connection:Atlanta:GA:B:11/7/92:  
 407-269-5188:Digital Decisions:Jerry Russell:FL:\$12/2/92:multiline  
 407-879-4823:PC Logic:W4NVC:Boca Raton:FL:BM:12/2/92:  
 408-395-1402:Saratoga Clone:WA6LYZ/WD5ICZ:Saratoga:CA:11/7/92:  
 408-683-0338:S2C2 BBS:Bob Shelton:San Martin:CA:11/7/92:  
 409-833-1795:The HAM Connection:N5UYH:Beaumont:Texas:12/8/92:  
 410-551-6517:KA3DXX Hamshack:KA3DXX:Severn:MD:11/30/92:new AC  
 410-661-2475:WB3FFV BBS:WB3FFV:Baltimore:MD:12/9/92:  
 410-661-2598:WB3FFV BBS:WB3FFV:Baltimore:MD:12/9/92:  
 410-661-2648:WB3FFV BBS:WB3FFV:Baltimore:MD:12/9/92:  
 412-766-0732:Blinklink:William Wilson:PA:B:11/7/92:  
 413-256-1037:Pioneer Valley PCUG:Amherst:MA:B:11/7/92:  
 414-543-6593:Holt Ave BBS:WI:B:12/2/92:  
 414-782-2227:Data Cache:WI:N:12/5/92:modem problems  
 415-574-3663:Toad Hall:J Thaddeus:San Carlos:CA:11/7/92:  
 415-595-2427:Toad Hall:J Thaddeus:San Carlos:CA:11/7/92:  
 416-431-6836:Connection:Toronto:Canada:B:11/7/92:  
 416-638-4794:Dits & Bits:VE3OY:Tornhill:Ontario:12/5/92:  
 416-827-0704:Amateur Radio:VE3RD:Can:12/5/92:Validation via packet  
 502-267-7422:Deckman's Exchange:N4VEH:Jeffersonstown:KY:D:11/7/92:300bps  
 503-286-3855:The Rose Fido:OR:B:11/7/92:  
 503-692-7097:Wireless BBS:wb7vhb:Tualatin:OR:12/5/92:  
 504-273-3116:HelpNet:W5KGG:Baton Rouge:LA:B:12/5/92:  
 504-897-6614:Digital Cottage:Fred Hatfield:7/24/92: 5  
 05-646-5194:Teacher's Pet:K5XY:LasCruces:NM:12/5/92:  
 508-385-3427:Salt Air BBS:KQ1K:Dennis:MA:B:12/5/92:  
 508-481-7147:Waystar BBS:Marlborough:MA:11/7/92:  
 508-949-3590:The Ham Shack:MA:B:12/5/92:  
 508-960-2226:W1FW-WWIV BBS:W1FW:N. Andover:MA:12/5/92:  
 510-481-0252:N6MON Ham BBS:N6MON:CA:B:12/5/92:new AC  
 510-778-5929:Infocline BBS:CA:12/5/92:  
 512-444-1052:Antenna Farm BBS:Austin:TX:B:12/5/92:

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 602-495-1797:Neighborhood Net:KB7DJE:Phoenix:AZ:+:12/5/92:  
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 609-663-8203:Masters Inn II:?:NJ:B:11/15/92:  
 609-667-5652:Liberty Bell:Lynn Graves:cherry Hill:NJ:-:11/15/92:  
 609-751-3847:Memory Link:?:NJ:B:11/15/92:  
 609-859-1910:Pinelands FIDO BBS:W2XQ:Vincentown:NJ:+:12/5/92:  
 612-426-0000:Digital Newsletter:K0TG:St. Paul:MN:B+:12/5/92:  
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 612-920-L5MN:NASA/ESA press rels.:L5 Society:Minneapolis:MN:S:-:11/20/  
 92:L5space  
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 619-692-1961:AA6WS BBS:AA6WS:San Diego:CA:-:11/20/92:  
 703-366-4299:Sparkie's Machine:KC4LWI:Roanoke:VA?:12/5/92:line noise  
 703-591-5744:Midnite Rider:Joe Reeves?:VA:B:11/21/92:  
 703-648-1841:Virginia Connection:Tony McClenny:Reston:VA:+:11/21/92:old files  
 703-680-5970:Virginia Packet:K4NGC:Woodbridge:VA:-:7/25/92:  
 703-734-1387:AMRAD BBS:K8MMO:McLean:VA:B+:12/5/92:  
 703-791-6198:Dos Spitzen Sparken:Dick Miller Manassas:VA:B:11/21/92:  
 704-545-7076:Advanced Electronic:?:?:B:11/1/92:  
 707-545-0746:Sonoma Online:Don Kulha Santa Rosa:CA:B:11/21/92:  
 708-394-0071:Samson BBS:KB9DIP:Arlington:IL:M:12/5/92:  
 708-529-1586:Elk Grove Repeater:N9DKO:Elk Grove:IL:-:11/21/92:local info  
 708-623-9783:R.D.D.S./HamHeaven:?:IL:\$S:12/5/92:swap/show  
 708-983-5147:Ken Strizel BBS:wa8wek?:IL:-:12/5/92:  
 708-983-8138:Ken Strizel BBS:Ken?:IL:-:12/5/92:  
 708-983-8929:Ken Strizel BBS:wa8wek?:IL:-:12/5/92:  
 713-280-8711:NASA Activities:NASA:Houston:TX:S Nasa info:7/2/92:  
 713-483-6500:NASA 1200bps/code 62511 :NASA:Houston:TX:S:7/2/92:NASA  
 713-579-8979:Breakfast Club:Jimmy Vance:Katy:TX:B:11/21/92:  
 713-879-1448:ACOM II:Eddie Runner:Houston:TX:B:11/21/92:  
 714-738-4331:OCA AMSAT BBS:Fullerton:CA:S:12/5/92:AMSAT  
 716-544-1863:RFCARC:WA2ZKD:Rochester:NY:B+:12/5/92:  
 716-544-2645:RFCARC:WA2ZKD:Rochester:NY:B+:12/5/92:  
 717-561-8145:Tec Board BBS:KA3ADU:Harrisburg:PA:M:12/5/92:  
 717-876-0152:Northeast File Bank:Stuart Wilson:Jermyn:PA:B:11/23/92:  
 718-761-5727:Programmers Corner:David Snyder:Staten Island:NY:B:11/23/92:

## RADIOAFICION MICROCOMPUTACION

Es una revista escrita en idioma español que se publica desde hace más de una década y circula en todos los países, desde los Estados Unidos hasta la Argentina. También en Brasil y España. Contiene cuando interesa al radioaficionado, desde la categoría de Novicio hasta la más alta en materia de comunicaciones terrenas y satelitales. En sus páginas se desarrollan temas escritos en forma didáctica por los más prestigiosos autores. La revista tiene además un formato digital y su texto puede leerse, imprimirse y estudiarse con una computadora y un modem recurriendo a los servicios que junto con muchos otros como la correspondencia electrónica, noticias de todo el mundo por las principales agencias, etcétera presta:

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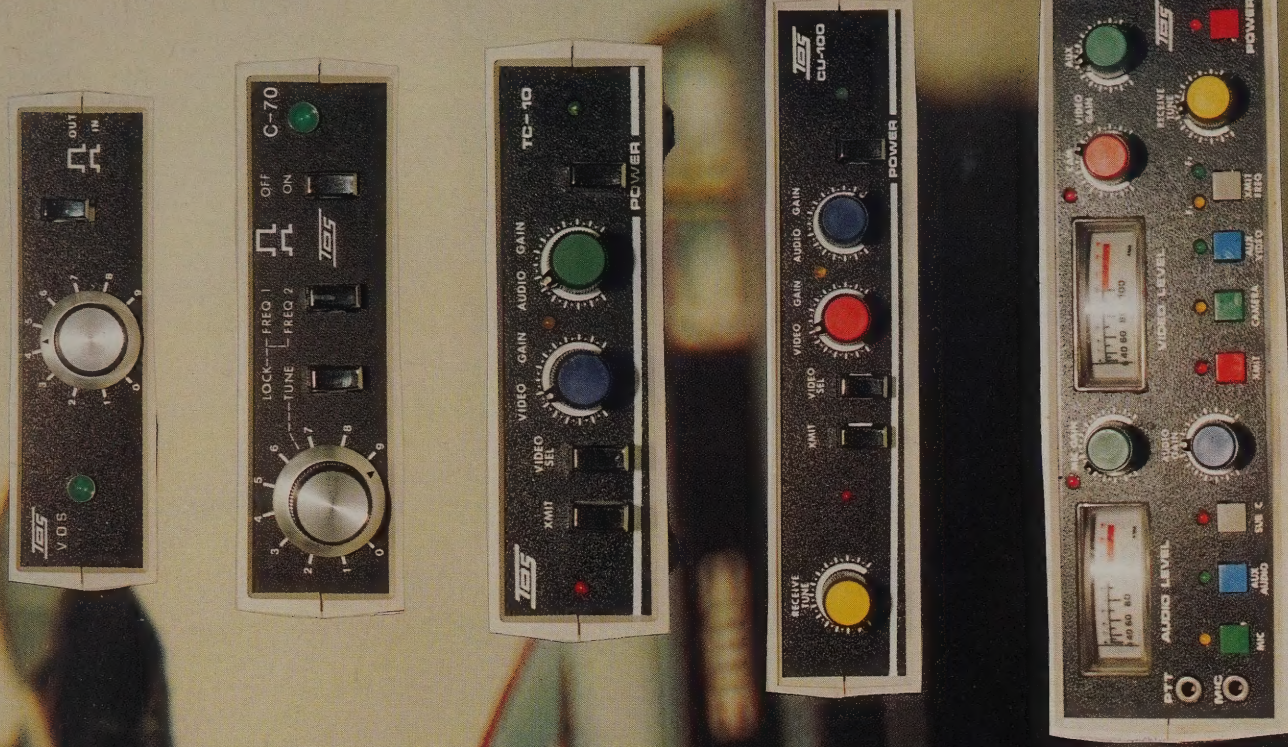
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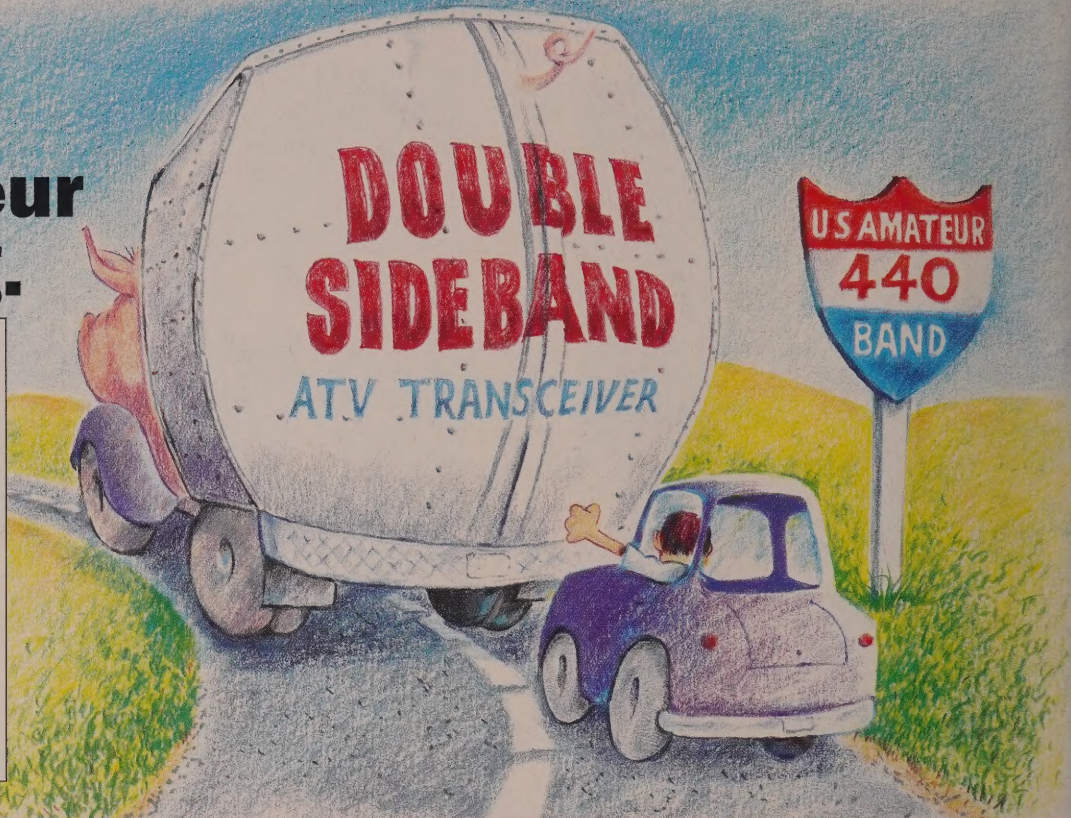
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Reviewed by Merle Reynolds W9DNT in May / Jun & Sept/Oct '90  
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